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on 24 February, 2020

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I	Bungalow outhouses in Gund Range, W. D. Kanara. Asbestos cement construction. Cost Rs. 2,500 showing a saving of 22 per cent. over ordinary construction	Frontispiece
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List of trees and shrubs mentioned in the Report and their Scientific names.

English and Vernacular names.	Scientific name.
Ain, matti ..	.. *Terminalia tomentosa.*
Anjan ..	.. *Hardwickia binata.*
Babul ..	.. *Acacia arabica.*
Bahan ..	.. *Populus euphratica.*
Bamboo ..	.. *Dendrocalamus strictus.*
Blackwood, Shisum ..	.. *Dalbergia latifolia.*
Heddi ..	.. *Adina cordifolia.*
Hirda ..	.. *Terminalia chebula.*
Honne ..	.. *Pterocarpus marsupium.*
Kakkai ..	.. *Cassia fistula.*
Kandi ..	.. *Prosopis specigera.*
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Khair ..	.. *Acacia catechu.*
Lantana ..	.. *Lantana camara.*
Mango ..	.. *Mangifera indica.*
Mulberry ..	.. *Morus alba.*
Nana ..	.. *Lagerstroemia microcarpa.*
Nim ..	.. *Azadirachta indica.*
Palas ..	.. *Butea frondosa.*
Rosha ..	.. *Cymbopogan martinii.*
Sandal ..	.. *Santalum album.*
Shigekai ..	.. *Acacia concinna.*
Shivan, Shivni ..	.. *Gmelina arborea.*
Simul, Sawar ..	.. *Bombax malabaricum.*
Tali ..	.. *Dalbergia sissoo.*
Tamarind ..	.. *Tamarindus indica.*
Teak ..	.. *Tectona grandis.*
Tiwas, Karimuttal ..	.. *Ougeinia dalbergioides.*
Tarwad ..	.. *Cassia auriculata.*

FOREST ADMINISTRATION REPORT OF THE BOMBAY PRESIDENCY INCLUDING SIND FOR THE YEAR 1932–33.

CHAPTER I.

1. Alteration in area. (Forms Nos. 51 to 51D.)

The areas of different classes of forests at the opening and close of the year are shown in the following table :—

Class of forest	Area on 1st April 1932	Added during the year	Excluded during the year	Area on 31st March 1933
	Sq. miles	Sq. miles	Sq. miles	Sq. miles
Reserved Forest	13,716	29	9	13,736
Protected Forest	1,152	52	71	1,133
Total ..	14,868	81	80	14,869

The areas added and excluded comprise :—

	Square miles	
	Gain	Loss
Afforestations against and disforestments in favour of cultivation	11	29
Conversion into reserved forest of areas excluded from Protected Forest last year	6	..
Alluvial accretions and erosions in Sind	27	14
Transfer from Reserved Forest to Protected Forest	24	24
Transfer from Protected Forest to Reserved Forest	2	2
Transfer from one Division to another	11	11
	81	80

Net gain 1 square mile.

Large areas of reserved forest, about 23 square miles, in charge of the Revenue Department in the Poona, Ahmednagar and Sholapur districts of the Central Circle were disforested chiefly for purposes of cultivation. About 6 square miles of reserved and protected forest in the Northern and Southern Circles were also disforested for the same purpose. Erosions in the Sind Circle resulted in a loss of 9 square miles of reserved and 5 square miles of protected forest.

Out of the 7 square miles of protected forest (Gurcharans) disforested last year in the Northern Circle for conversion into reserved forest, 6 square miles were notified as reserved forest.

There was an addition of 5 square miles to the reserved and protected forest owing to afforestments in the Northern and Sind Circles and of 27 square miles to the reserved forest due to alluvial accretions in the Sind Circle.

In accordance with the proposal sanctioned in Government Resolution, Revenue Department, No. 8453/24, dated 13th May 1927 the rabi numbers in the Baragaon Dangs aggregating 6 square miles were constituted protected forest and handed over to the Forest Department for management.

The forest area in charge of the Forest and Revenue Departments stood as follows :—

	On 1st April 1932			On 31st March 1933		
	Reserved	Protected	Total	Reserved	Protected	Total
	Sq. miles	Sq. miles	Sq. miles	Sq. miles	Sq. miles	Sq. miles
In charge of the Forest Department ..	12,010	529	12,539	12,014	551	12,565
In charge of the Revenue Department ..	1,706	623	2,329	1,683	621	2,304
Total ..	13,716	1,152	14,868	13,697	1,172	14,869

The forest area in the various circles at the close of the year was as follows :—

	Square miles
Northern Circle	3,809
Central Circle	5,282
Southern Circle	4,619
Sind Circle	1,159

2. Forest Settlements.

The area under settlement at the commencement of the year was 49 square miles to which an area of 43 square miles was added. Forty-five square miles were settled during the year and 47 square miles remain to be settled. An expenditure of Rs. 255 was incurred.

The acquisition of certain malki lands in Mandvi Taluka, Surat District, for inclusion in reserved forest is still pending. The Government waste lands in the same taluka, aggregating about 11 square miles notified under section 4 of the Indian Forest Act in May 1928, still await final notification under section 20 of that Act owing to the noncompletion of the enquiry by the Forest Settlement Officer into the rights of the persons concerned.

The settlement of the forest area (1,713 acres) in the Kolaba Division is still pending. The High Court has confirmed the decree of the Thana District Court and dismissed the appeal of Sardar Biwalkar. The settlement of this area cannot be taken up till the appeal period is over.

3. Demarcation.

Thirty-five miles of new boundaries were artificially demarcated in the Northern, Southern and Sind Circles. Forty-five miles remain to

be demarcated in the Southern Circle. The existing boundary lines and marks were kept in a state of repair at a cost of Rs. 3,002, a great part of this work being done as usual by forest subordinates.

Further clearing of the boundary line between the Dangs (Surat Division) and the Baroda State was carried out for a length of 6½ miles, the tree growth on the line being sold to, and cut by, contractors.

4. Forest Surveys.

No surveys were carried out. The area remaining to be surveyed is 13 square miles in the Northern Circle, 276 square miles in the Southern Circle and 930 square miles in the Sind Circle.

The expenditure incurred on constitution of State Forests was Rs. 86 in the Northern Circle and Rs. 250 in the Central Circle.

CHAPTER II.

MANAGEMENT OF STATE FORESTS.

1. Regulation of Management.

(a) Preparation and Control of Regular Working Plans.

Preparation (Form No. 55).—The following working plans received the sanction of Government :—

Working Plan for the exploitation of teak in occupied (Varkas) lands in the Thana District (this plan was sanctioned after close of the year in Government Resolution, Revenue Department, No. 43/33, dated 7th April 1933).

Revised Working Plan for the Soppinhosalli High Forest (Block XXVII) in the Kanara Southern Division. (Government Resolution, Revenue Department, No. 9005/28, dated 3rd February 1933).

Work in connection with the following working plans was continued during the year :—

(1) Nasik Scrub and Teak Pole Jungles (East and West Nasik Divisions).

(2) Thana working plan.

(3) Working Plan for the Igatpuri forests.

(4) Working Plan for the Satara forests.

(5) Working Plan for the reserved forests of Poona Division.

(6) Working Plan for the Nagzari and Kalinadi-Kaneri slopes of Kanara Northern Division.

(7) Working Plan for the Halayal Teak Pole Forests including Block VII-A of Kanara Northern Division.

(8) Working Plan for the Fuel and Fodder Reserves in the Bijapur District.

(9) Working Plan for the Yellapur-Mundgod Teak High Forests.

A working plan drawn up by the Gurcharan Officer for the Protected Forests in charge of the Forest Department and Nominal Reserves of the Thana District, was scrutinized by the Chief Conservator who suggested certain alterations. The plan is now being completed.

A preliminary report for the working of the Thana Gurcharans was submitted by the Gurcharan Officer and is being rewritten in the light of certain additions and alterations suggested by the Conservator of Forests, Northern Circle.

A provisional working plan for the Castle Rock Firewood Depot in the Kanara Western Division was approved by the Collector of Kanara and instructions have been issued to draft and submit a regular working plan for the sanction of Government.

The casuarina plantations of the Kanara Western Division were inspected and it has been decided that a revision of the working plan for these plantations should be undertaken during the next working season.

Revision of the Hyderabad Division (Sind Circle) working plan was taken in hand and field work completed. The preliminary report is now under consideration.

(*b*) *Control of Working Plans.*

The prescriptions of working plans were generally followed. In the Northern Circle some coupes remained unsold for want of demand owing to poor quality of growth, long lead or inaccessibility. In the Central Circle, though some coupes of inferior quality remained unsold, the majority were disposed of at satisfactory prices particularly in the West Khandesh Division. Continued trade depression was mainly responsible for arrears of work in the Southern Circle. The Improvement fellings in the Ramanguli-Ankola High Forests were held over owing to non-sale of large stocks of timber at Hattikeri depot. There was a poor demand for Tali palms in Kanara Southern Division, and palms marked for felling in 1930–31 still remain to be sold. In the Karachi Division, which suffered heavily from the 1929 frost and where the prescriptions of the working plan were suspended, arrear coupes of 1930–31 and 1931–32 were worked in two Ranges. A large quantity of dead wood was exploited in lieu of the prescribed coupes in one Range of the same Division, the regular coupes being held in abeyance. Certain coupes in the Sukkur, Shikarpur and Larkana Divisions were withheld from auction owing to the congested state of the fuel market and to the large stocks of fuel remaining with contractors.

2. Communications and Buildings.

(*a*) *Roads and Bridges.*

Construction work was in progress on 35 miles of new roads and repairs were carried out over 1,380 miles of old roads. The total expenditure amounted to Rs. 70,441 on new works and Rs. 88,841 on repairs, compared with Rs. 43,224 and Rs. 91,198 last year. The expenditure incurred on

repairs includes charges for maintenance of the Alnavar-Dandeli Railway, viz. Rs. 40,413 against Rs. 44,819 in the previous year.

Further work in connection with the proposed Ozar-Saiwan road was carried out by the Forest Engineering establishment.

The question of constructing the following 4 roads in the Northern Circle is under consideration :—

(1) Temba-Parali, (2) Deogaon-Khock, (3) Bhiwandi-Telhar-Shirol and (4) Shenwa-Dolkhamb.

The Temba-Parali road would result in a considerable immediate increase in revenue from the Wada forests and would greatly facilitate the inspection of the East Thana Division, besides being of great use to the public as it would afford a short cross road between the coast and the G.I.P. Railway. Proposals for constructing a 2nd class metalled road have been called for.

The Deogaon-Khock road is a link road and will when constructed shorten communication between Thana and Nasik. It will be useful in providing for the extraction of the malki teak from the northern half of the Mokhada Petha and also in accelerating the exploitation of certain forest blocks in that Petha.

The other two roads are of benefit both to the Forest Department and to the general public and the District Local Board will be asked to undertake their construction, as soon as the malki teak sale contributions are allocated.

For want of funds no progress could be made on the Dara-Dhadgaon road in the Central Circle.

The District Local Board, Kolaba, propose to construct (1) Chaul-Medha road and (2) Gadha-Wangani road running through the heart of forests. These roads are likely to increase the value of the interior forests through which they will pass. Government have sanctioned a contribution of Rs. 1,000 for the first mentioned road payable in instalments of Rs. 500 in 1933–34 and Rs. 100 per annum in the succeeding 5 years.

The Bridge over the Birkhol Nalla on the Kadra-Shivpur road in Kanara W. D., which was commenced in 1931–32 was completed at a total cost of Rs. 6,400, the work being carried out by the Forest Engineering establishment.

(*b*) *Buildings.*

Out of Rs. 53,251 spent on buildings, Rs. 29,056 were spent on new works and the balance of Rs. 24,195 on repairs. The corresponding figures for the previous year were Rs. 5,816 and Rs. 23,176 respectively.

The necessity for providing housing accommodation for subordinates is keenly felt almost everywhere, but progress is slow owing to lack of funds. This matter requires immediate attention as soon as funds become available.

Seven Public Works Department Inspection bungalows in the Thana District were transferred to the Forest Department under Government Resolution, Public Works Department, No. 3684/27, dated 22nd October 1932. Five of these have been taken over. The transfer of 2 District bungalows in the Nasik District was also sanctioned in Government Resolution, Public Works Department, No. 3684/27-H, dated 29th March 1933.

(c) *Miscellaneous (other works).*

The main items of expenditure under this head were sinking of new wells, fencing of compounds, telephone rent, repairs to bunds and *karias* in Sind etc. The expenditure on new works was Rs. 1,814 and on repairs Rs. 10,027, against Rs. 2,540 and Rs. 7,399 in the previous year.

The telephone line from Jharia to Waghai in the Dangs was dismantled and its extension from Ghogli to Sundha where the Sundha Mill is at present working was completed.

The telephone line between Yellapur and Kirwatti in Kanara E. D. was closed owing to the transfer of the headquarters of the Divisional Forest Officer from Yellapur to Dharwar.

3. Protection of Forests.

(a) *General Protection.* (Form No. 57.)

The following statement compares the number of forest offences of the year with those of 1931–32 and the average of the last three years :—

Class of offence	1932–33					1931–32	Average of 1929–30 to 1931–32
	Northern Circle	Central Circle	Southern Circle	Sind Circle	Total		
I. Injury to forest by fire.	635	623	421	223	1,902	2,013	2,091
II. Unauthorised felling or removal of produce.	3,935	4,349	1,329	1,500	11,113	11,740	10,542
III. Unauthorised grazing.	1,979	2,067	646	1,953	6,645	6,525	6,430
IV. Other offences.	1,099	1,322	322	181	2,024	2,679	2,540
Total of 1932–33 ..	7,648	8,361	2,718	3,857	22,584	..	..
Total of 1931–32 ..	7,446	9,030	3,236	3,275	..	22,987	..
Average of 1929–30 to 1931–32.	6,932	8,686	3,008	2,977	..	..	21,603

As compared with the previous year there was a decrease of 403 in the total number of reported offence cases, the Central and Southern Circles contributing thereto. There was a decrease of 141 and 627 under classes I and II and an increase of 120 and 245 under classes III and IV.

Causes for the increase or decrease in fire offences are discussed under " Protection from fire ".

Unauthorised fellings.—There was on the whole a decrease of 627 cases as compared with the previous year though the Sind Circle records an increase of 229 cases. From the Panch Mahals Division it is reported that the recent grant of the privilege of taking deadwood by Bhils and Naikadas for sale has accounted for a considerable fall in the number of offences under this head. The increase in the Sind Circle is attributed to greater vigilance on the part of subordinates.

Unauthorised grazing.—There was an increase of 120 in the total number of offences committed under this head. The Northern, Central and Southern Circles show a decrease of 43, 96 and 91 cases while the Sind Circle shows an increase of 350 cases. The decrease in the Northern Circle is chiefly attributed to the levy of heavy compensation when offenders were detected. In the East Khandesh Division there was a decrease of 80 cases compared with the previous year and the Divisional Forest Officer reports that the new system of painting conspicuously sub-block boundary cairns in the scrub forests has contributed to this result. The increase in the Sind Circle is said to be due partly to the presence of Kohistan (hill) maldars and others in large numbers owing to revenue lands having come under cultivation under the Barrage scheme and partly to greater activity and vigilance exercised by subordinates in the detection of grazing offences. The Conservator reports that considerable damage was done by goats and camels to coupes under regeneration and, he has issued instructions whereby in future such felled coupes will be substantially fenced by contractors.

Other offences.—On the whole there was a decrease of 245 in the total number of offences though the Northern Circle shows an increase of 277 as compared with the previous year. The offences represent cases of violation of transit and game rules, encroachments in forest areas etc. The increase in the Northern Circle is mainly attributable to the stricter application of the transit rules.

Three hundred and fifty-four new cases were taken to court. 374 cases including 163 cases pending from the previous year were decided and of these 336 or 90 per cent. resulted in convictions. 18,867 cases were compounded and compensation amounting to Rs. 1,04,333 was recovered in 18,198 cases, the average per case being Rs. 5·7 as compared with 6·9 in the previous year. Offenders in 669 cases were let off with a warning and in 3,533 or 10 per cent. of the new and pending cases the offenders were not detected.

There were 2 important sandalwood theft cases in the Dharwar-Bijapur Division, Southern Circle. In one case about 5½ khandies of Government sandalwood were being smuggled from the Hangal Range. The

offenders were caught while they were arranging for transport of the material by motor bus to a railway station. Of the 4 offenders, 3 were convicted and sentenced to imprisonment and fines. In the second case, a malki sandalwood dealer brought some converted sandalwood from outside and mixed it with his malki wood. The offenders involved in the case were convicted and sentenced to pay fines. The conviction was however set aside by the appellate court.

In the Sind Circle 9 cases were taken to court under the Indian Penal Code under various charges, viz. assaulting and making false allegations against forest subordinates, stealing rafters of lye wood, and forcibly rescuing cattle found illicitly grazing in forest. Six of these cases resulted in convictions, one was withdrawn and two are pending in the court.

(*b*) *Protection from fire.*

The figures in the subjoined statement compare the result of the two fire seasons, 1st June 1931 to 31st May 1932 and 1st June 1932 to 31st May 1933. These figures do not tally with those in appendix 58 which are for the financial year, viz. 1st April 1932 to 31st March 1933 :—

Circle	Fire season of	Area attempted to be protected	Failures	Area actually protected	Percentage of area actually protected	Cost	Cost per square mile protected
		Sq. miles	Sq. miles	Sq. miles	Sq. miles	Rs.	Rs.
Northern ..	1932–33 ..	3,334	59	3,275	98	16,396	5·0
	1931–32 ..	3,316	66	3,250	98	15,192	4·7
Central ..	1932–33 ..	3,831	345	3,486	91	7,221	2·0
	1931–32 ..	3,830	329	3,501	91	7,660	2·2
Southern ..	1932–33 ..	1,649	79	1,570	95	6,394	4·1
	1931–32 ..	1,716	87	1,629	95	6,100	4·0
Sind ..	1932–33 ..	480	4	476	99	650	1·3
	1931–32 ..	501	13	488	97	751	1·5
Total ..	1932–33 ..	9,294	487	8,807	95	30,661	3·5
	1931–32 ..	9,363	495	8,868	95	29,703	3·3

In the Northern Circle compared with the figures for the past year there has, on the whole, been a reduction both in the number of fires and in the area burnt. In the Panch Mahals, North Thana and West Nasik Divisions, however, there were more fires. Contractors of grass and *timbru* leaves and cattle thieves are reported to be responsible for some of these fires while a net work of roads, cart tracks and railway lines passing through the forests account for a certain number of accidental fires. One large fire at Mairawani in the West Nasik Division is reported to have been intentional and malicious and due to the failure of the villagers to secure the grass kuran for interested parties at a low price.

The decrease in other Divisions is mainly due to villagers having promptly turned out to extinguish the few fires that occurred. The communal punishment inflicted on the villagers of Suryamal in East Thana Division by way of suspending the grazing privilege for one year had the desired effect in that villagers like other villagers in the Division promptly rendered help in putting out fires. In view of the change in their attitude towards forest protection the suspended privilege has been restored.

The total area burnt in the Central Circle was more than in the previous year. North Khandesh Division is chiefly responsible for the increase, which is due to three very big fires in the Akrani which account for about half the total area burnt in the Division. The population in the Akrani is very small, and it is difficult to get the fires under control on account of high winds and the difficult nature of the country. There was also an increase in the area burnt in the West Khandesh Division which is attributed to the indifference of the people in the bordering villages of Pimpalner and Chinchpada Ranges.

Compared with the figures for 1931–32 there has been a reduction in the number of fires and in the acreage burnt in the Southern Circle, though Kanara Eastern Division is responsible for an appreciable increase which is attributed to the lack of the usual hot weather showers. Protection in the more important teak and sandalwood forests was on the whole good, though a small portion of the High Forest area in the Nagargali Range of the Belgaum Division was burnt. At the close of the fire season two large fires occurred in the young teak plantations of the Ghotegali Round and in compartment 26 of Block X in Gund Range of the Kanara Western Division. In Kanara Eastern Division the total area of plantation burnt was 794 acres. The Divisional Forest Officer, Eastern Division, Kanara, reports that the system of firelines traced round the inside of the perimeter of plantations is not yet perfected and hopes in future to make it more successful. With the exception of the fires, referred to above, the remainder of the planted area in the Circle was successfully protected.

In Sind there was a decrease both in the number of fires and in the area burnt and the warnings issued last year are said to have produced a salutary effect.

Rewards in the shape of turbans and silver bangles of an aggregate value of Rs. 690–4–0 were distributed among Patils and village servants in the Surat Division for conspicuous help in fire and general protection in the Dangs. Money rewards amounting to Rs. 79 were given to helpers in the East Khandesh Division and remission and reduction of grazing fees were granted in certain cases in the West Khandesh Division. In the Southern Circle 26 villages were rewarded with free or concessional grazing for good protection. Several Patels and Kulkarnis in Badami and Kod Ranges of the Dharwar-Bijapur Division were granted remission of grazing fees. Remission of grazing fees was also granted in the case of 326 cattle owned by charitable Institutions in the Badami Range, Bijapur District.

The following table compares the number and origin of fires for the two financial years 1931–32 and 1932–33 (Form No. 59) :—

Origin.	Number of fires.		Area burnt in acres.	
	1932-33	1931–32	1932–33	1931–32
A. Originated in Departmental fire conservancy operations.	76	18	19,500	1,915
B. Crossing exterior fire-lines	123	177	60,675	44,706
C. Accidental (persons in Forest).	522	712	53,392	144,861
D. Intentional (persons in Forest).	146	120	21,375	42,394
E. Railway Engines ..	10	13	644	604
F. Lightning	....	1	....	2
G. Causes unknown ..	1,006	1,031	163,602	142,884
Total ..	1,883	2,072	319,188	377,366

(*c*) *Protection from cattle.* (Forms Nos. 60 and 61.)

The forest areas open and closed to grazing were as follows :—

	Sq. miles.	Per cent.
Closed to all animals for the whole year	1,397	9·40
Closed to all animals for part of the year ..	313	2·10
Open to all animals except browsers for the whole year.	9,667	65·01
Open to all animals except browsers for part of the year.	14	0·10
Open to all animals for the whole year	3,439	23·13
Open to all animals for part of the year	39	0·26
Total ..	14,869	....

Nearly 90 per cent. of the Presidency forests were open to grazing of horned cattle throughout the year.

The reduction in the period of closure from 10 to 5 years was continued in Thana forests and in some parts of the Panch Mahals Division. Similar reduction was also made in Kolaba Division. In other parts closure was relaxed as usual in cases of real necessity.

The number of cattle admitted to grazing was as shown below :—

Circle.	Horned cattle.		Sheep and Goats.	
	1932–33	1931–32	1932–33	1931–32
Northern ..	749,431	710,770	128,698	107,845
Central ..	707,751	694,756	215,014	276,624
Southern ..	322,878	368,000	77,478	81,858
Sind ..	40,417	31,897	92,625	40,556
Total ..	1,820,477	1,805,423	513,815	506,883

Circle	Camels.		Other animals.		Total.	
	1932–33	1931–32	1932–33	1931–32	1932–33	1931–32
Northern ..	..	..	2,162	1,079	880,291	819,694
Central ..	..	..	8,351	8,025	931,116	979,405
Southern ..	..	..	178	95	400,534	449,953
Sind ..	2,284	2,367	3,225	3,115	138,551	77,935
Total ..	2,284	2,367	13,916	12,314	2,350,492	2,326,987

There is an increase in the number of animals grazed in the Northern and Sind Circles. The increase in the Northern Circle is particularly noticeable in the East Nasik Division, the grazing receipts having risen from Rs. 51,279 in 1931–32 to Rs. 68,395 in 1932-33, and this is due to greater vigilance exercised in recovering grazing fees due. In the Sind Circle owing to extensive Barrage cultivation, more forest had to be thrown open to browsers and on account of lack of rain in Kohistan large numbers of sheep and goats were brought to the forests of Karachi and Hyderabad Divisions. The decrease in the Central Circle in the number of sheep and goats is chiefly due to fewer Thilaries having come into West Khandesh Division owing to the fact that areas of pasture forest, which hitherto formed extensive grazing grounds for these animals, were considerably reduced by being given out for cultivation by the Revenue Department. The principal reason for the decrease in the Southern Circle is that the grazing fees collected during 1932–33 did not include arrears as was the case in 1931–32 owing to the Civil Disobedience Movement.

Out of 2,350,492 cattle admitted to grazing in the forests, 650,438 were allowed free. Corresponding numbers for the previous year were 2,326,987 and 609,141. As per Government Resolution, Finance Department No. 8815/28 dated 6th June 1932, the Mahars of the forest hill villages of the Akola and Sangamner talukas of the Ahmednagar District were exempted from payment of grazing fees in recognition of the services rendered by them at the time of the Civil Disobedience Movement. The number of cattle grazed free was 863.

Grazing fees collected during the year amounted to Rs. 4,98,662 as compared with Rs. 4,82,840 in the previous year, the value at full rates being Rs. 21,94,627.

The number of cattle impounded for unauthorized grazing in open and closed forests is given in the following table :—

Circle.	Horned cattle.		Sheep and Goats.		Other animals.		Total.		Total of open and closed.	
	Open	Closed	Open	Closed	Open	Closed	Open	Closed	1932-33	1931-3
Northern ..	1,740	21,233	12,858	3,197	83	37	14,681	24,467	39,148	37,178
Central ..	5,112	22,448	10,484	3,136	95	123	15,691	25,707	41,398	39,087
Southern ..	452	5,686	1,142	3,813	..	4	1,594	9,503	11,097	15,707
Sind ..	2,828	1,218	1,143	3,134	311	746	4,282	5,098	9,380	8,234
Total ..	10,132	50,585	25,627	13,280	489	910	36,248	64,775	101,023	100,206
Average of three years (1929-30 to 1931-32).	13,884	55,280	19,988	16,851	328	1,227	34,200	73,358	107,558	

On the whole there is an increase in the number of impoundings, all circles except the Southern Circle contributing thereto. The increase is attributed chiefly to greater keenness shown by subordinates in the detection of offences. In the Sind Circle many owners of cattle elected to pay pound fees in preference to grazing fees and fines, the former being less than the latter.

(d) Protection against injuries from natural causes.

Vegetable pests.—Cutting or uprooting of climbers, lantana, prickly-pear etc., was carried out through the agency of forest contractors and subordinates and in some parts by employing labour. An area of about 195 acres in the Poona Division was given out for temporary cultivation on condition that lantana was eradicated and the area sown with teak and other suitable species.

Animal pests.—Elephant, bison, sambhar, monkeys, porcupine, wild pig and rats were as usual responsible for a considerable amount of damage in plantations. Porcupines caused much damage in Mallani coupe in Kanara Southern Division where more than half the seedlings, which seemed well established, were destroyed. Damage by bison was particularly intense in Gule coupe in the same Division where about 5 acres of plantation were totally destroyed. Rats or some other rodents are reported to have destroyed about 5,000 seedlings in the riverside nursery at Sunksal during the early part of the monsoon.

Insect pests.—Teak defoliation was considerable in the Amga plantations in Kanara Northern Division. Some damage was caused to the *khair* seedlings in North Thana Division by a beetle larva *Celosterna Scabrator* (*Cerambicidæ*). Crickets and grasshoppers caused damage to young seedlings shortly after germination in regeneration areas in Kanara Southern Division, on account of which dibbling gave very poor results. In the Sukkur Division, Sind Circle, defoliators caused much damage to *Kandi* (Prosopis spicigera) leaves and flowers adversely affecting the seed yield from this species.

Frost and erosions.—In Kolaba Division further damage was caused by erosion to the casuarina plantations on the sea coast at Akshi and Nagaon resulting in a loss of 130 trees at Akshi and 58 trees at Nagaon. So far 10 acres have been washed away. Similarly 68 acres were eroded at Davli Ranjankhar but this area did not contain any tree growth. In Sind Circle the total area eroded by action of the river Indus was 14 square miles as against 16 square miles in the previous year. The amount realized by sale of the material exploited from eroded areas was Rs. 20,138. A sum of Rs. 27,915 was also realized by sale of material obtained from about 5 square miles which were exploited in anticipation of erosion.

CHAPTER III.

SILVICULTURE.

1. Afforestation and Regeneration of Forests.

(i) General progress of areas under regeneration.

The condition of areas artificially regenerated in past years was generally satisfactory everywhere. In the Northern Circle the plantations at Badgi, Musla and Sawarana in the West Nasik Division continued to make healthy progress. Cleanings were carried out in the four oldest plantations at Badgi and Musla both of which give promise of a splendid final yield.

The clearing of a five foot line along the periphery of regenerated patches is now almost a permanent feature in the Panch Mahals and West Thana divisions. It has proved effective in protecting young plants not only from fire but possibly from root competition of inferior species, a problem which is attracting attention in modern silvicultural practice.

Artificially regenerated areas in Kolaba and West Khandesh of the Central Circle are reported to be in excellent condition.

The Southern Circle has a very large area under plantations as the sub-joined table shows :—

Division.	Total area artificially regenerated with teak since 1916.	Area successfully regenerated	Area in which regeneration failed.	Remarks.
1	2	3	4	5
	Acres.	Acres.	Acres.	
Kanara N. D. ..	(*a*)2,904	2,633	271	(*a*) High forest.
„ E. D. ..	(*a*)5,134	3,593	1,541	(*b*) Coast inland.
„ S. D. ..	(*a*)2,438	2,400	38	(*c*) High forest commenced in 1918 and not 1916.
	(*b*)5,986	5,600	386	
„ W. D. ..	793	693	100	
Belgaum ..	(*c*) 228	164	64	
Total (*a*) and (*c*) ..	11,497	9,483	2,014	
(*b*) ..	5,986	5,600	386	
Grand Total ..	17,483	15,083	2,400	

All young plantations in Kanara Northern Division were successfully protected against damage from fire. First thinnings were carried out in several of the plantations ranging between the ages of 7 and 10 years all of which are now well established. In the Haliyal teak pole forests apart from teak the raising of junglewood especially *matti* (*Terminalia tomentosa*) in open places outside the prepared patches is receiving attention and the results attained are encouraging. Under the protection of *cassias* chiefly in blocks Nos. VII to IX, a considerable advance has been made in the artificial propagation of sandal. Indifferent results were obtained in the case of plantations raised during the year in Eastern Division Kanara and this is attributed to the fact that the monsoon after a late start gave too heavy and continuous rain. The Ganeshgudi and Wadehukli plantations are reported to have responded well to thinnings carried out in former years and to be in a satisfactory condition.

Progress in the older plantations in the drier forests in the east and in the pole areas is stated to be less satisfactory.

The Conservator of Forests, Southern Circle (Mr. D. B. Sothers) had after an interval of 10 years an opportunity of inspecting most of the plantations in Southern Division Kanara and was impressed by the progress made, particularly in the plantations raised in fuel coupes, many of which, he considers, are in no way inferior to those in the high forests above ghats, the conversion from a comparatively worthless fuel jungle into a valuable and healthy young teak bearing forest being most impressive.

85 per cent. of the plantations in Gund, Kanara Western Division, are reported to be in good condition. In other parts of the division patch planting of teak on one acre *rabs* was tried in the fuel coupes of the Supa, Karwar and Kadra ranges. The results in Supa were not promising and no further attempts will be made in this area but in Karwar and Kadra very encouraging results were secured, so much so that it is proposed to pay more attention to this work and make a more liberal allotment of funds for the purpose. Plantations in fuel areas within easy reach of the sea coast besides being cheaper to form are likely to yield, on account of accessibility higher returns than plantations in high forest.

In Sind the inundation of the year, though late and of somewhat short duration was above normal and while it benefited existing growth on high levels, it submerged and destroyed a large proportion of seedlings on lower levels. The area flooded was 5,28,828 acres compared with 2,20,020 acres last year and 5,71,500 acres the year before.

(*ii*) *Establishment of Reproduction under Working Plans or Schemes.*

(Form No. 62A).

(*a*) *Mainly natural.*

Natural reproduction from coppice and root shoots and suckers was normal throughout the Presidency and Sind.

There was the usual crop of natural teak seedlings in the forests of the Thana divisions but the percentage of survivals is insignificant owing to

several adverse factors such as overhead and side cover of tall grasses, trampling by cattle etc. In the Panch Mahals there was a sparse occurrence of natural reproduction from seed and in the Dangs owing to a bad teak seed year natural regeneration was poor. In West Nasik owing to the introduction of improvement fellings under the revised working plan for Peint natural regeneration has been stimulated and gets a fair chance to establish itself. In East Nasik and the above-ghat forests of West Nasik constant trampling by cattle tends to convert otherwise suitable pockets of soil into a hard-pan incapable of supporting young plant life, while in the low-lying black soil areas such *babul* seedlings as occur are exposed to damage by men, goats and fire. Unrestricted grazing, which does not exclude even sheep and goats, in the East Nasik division is degrading the forests and converting them into barren wastes. In the working plan under preparation it is proposed to restrict browsing considerably in order to preserve the forests from utter destruction.

Natural regeneration of teak was disappointing in all divisions except in Kolaba and West Khandesh. There was no natural reproduction of *anjan* as there was no seed crop.

In Kanara Eastern Division owing to a diminution of fires during the past few years natural reproduction of teak, *honne* and *sisum* has become more marked. *Dendrocalamus strictus* has commenced to seed in the south of the same division.

Natural reproduction of sandal in Satara, Belgaum and Dharwar-Bijapur Divisions is reported to have been satisfactory especially in the Hangal-Dhundshi Range and in parts of the Kalghatgi, Dharwar and Badami Ranges.

Conditions in Sind were normal.

(b) Mainly artificial.

Northern Circle.—Teak seed both artificially treated and weathered were used for dibbling in burnt patches in all divisions where teak thrives. Casualties and failures were made good by transplants and "stumps". In East Nasik Division for the first time a systematic effort was made to carry through a programme of artificial regeneration and though the work was limited in scope and the results none too satisfactory it has been of considerable educative value to the staff which hitherto had no experience in this phase of practical forestry. In the three Thana Divisions 8,241 acres, as against 6,200 acres last year, were successfully regenerated.

Central Circle.—In Kolaba, the system of raising forest species in conjunction with field crops in exploited coupes has caught on and considerable progress was made. Forty-nine coupes were regenerated in this manner and in 31 coupes 2-year old root and shoot pruned seedlings were extensively introduced with a 12 foot espacement on unburnt soil. Bamboo seedlings and cuttings gave on the whole rather poor results. Casuarina was successfully regenerated in the Dapoli and Alibag plantation areas. In Satara 400 silver oak (*Grevillea robusta*) were transplanted in the Mahableshwar range but of these only 54 survived.

Southern Circle.—In the Kanara Northern Division, 100 acres in Series 1-7B Mandurli, 98 acres in Series IV-14-A Amga and 148 acres in Series VIII-10 (2)—Tatwal, were regenerated during the year, the espacement adopted being 9′×9′ or 12′×6′. All the three plantations were well stocked and the maximum height in the portions planted up during the first fortnight of May in Kulgi and Virnoli was as much as 12 feet at the end of the first season. Stump planting of teak (*Tectona grandis*) on prepared patches and sowings of junglewoods outside the patches were carried out in all the teak pole coupes with the usual success. In addition, sandalwood (*Santalum album*) was also raised with marked success in combination with *Cassia* in the drier region of Blocks VII to IX.

In the Kanara Eastern Division, the total area planted during the year was 624 acres as against 757·43 acres in the year 1931–32. Less regeneration felling was done during the year under report in anticipation of a shortage of funds. The system of planting small selected groups in the Teak Pole areas, and experimentally in the High Forests, has been extended, and so the area of plantation shown nearly represents the actual area planted with teak. In former years a larger proportion was of areas clear felled and grouped ; in these only a proportion, ranging from 1/5th to 2/3rds was actually planted.

Planting operations were carried out in all the Blocks of the Yellapur-Mundgod High Forest Plan except Blocks V, XIII, XV and XVII. Block V has been abandoned for economic reasons. In Blocks XIII, XV, and XVII, Improvement felling was done in order to allow the staff to concentrate on more accessible and more promising areas in other blocks. With such slight modifications, the planting programme is keeping pace with exploitation in most blocks.

In view of the impending revision of the Yellapur Mundgod High Forest Plan, and also in order to utilise the enormous quantity of slash from the Improvement felling in Block XIII compartments 36 and 37 (Yellapur Range) 200 groups of $\frac{1}{4}$ to $\frac{1}{2}$ acre each were burned, and planted in these compartments. The groups were more scattered but the results of planting are excellent. A similar method was followed in the regeneration coupes of Blocks III, XI and XII, the groups being concentrated in definite areas, and extending to 1 acre in size. In all these areas rain interfered with the burning and the results so far are disappointing.

In Kanara Southern Division, 709 acres of clear cut coupes and regeneration areas in High Forest were artificially planted with teak at a total cost of Rs. 2,555. For want of funds planting of cleared areas in the Casuarina Blocks was postponed. A sufficient number of seedlings have been raised in nurseries for planting the whole area in the year 1933–34.

In the Kanara Western Division 25·1 acres were planted with Casuarina (*Casuarina equisetifolia*) 12′ × 12′ in two plots in Chitakule and though one of the plots suffered considerably from a larval attack in the beginning and even now is somewhat stunted in growth, the main plantation was quite successful and has plants up to 12 feet in height

with few casualties. The total expenditure incurred was Rs. 1,001. 50 acres were regenerated with teak in Gund, half the area by means of seedlings from dibbled seed and where this failed by transplants, and the remaining half of the area by means of stumps, planted 6′ × 6′. The entire area was fully stocked and at the end of the year plants up to 4 feet in height were to be seen in the dibbled half and up to 6′ in height in the stumped half. Some of the most promising plants had their tender shoots broken by monkeys and had to be cut back. The total cost to end of the first year including clear felling was Rs. 2,535.

In Belgaum division, Regeneration Area No. A/7 of Nagargali Range was planted with 20,582 teak seedlings at a cost of Rs. 190. The number of survivals is 18,752. The plantation is in a very flourishing condition. The usual regeneration works were carried out in the Teak Pole coupes. The details of the work done of introducing teak in the Khanapur Range are given below :—

Blocks and coupes.	Number of patches.	Number of teak plants raised.	Survivals.
I—4, II-2, III-B/3, IVB-2, V 2, XII-2 and XIX-2.	69	14,926	13,990

Weathered seed only was used.

Similarly, progress with sandalwood was made by sowing seeds in the same range with the following results :—

Blocks and coupes.	Number of plants raised.	Survivals.
II.S.-20, II.S. 25, I.S. 27, XI.S-4 and 25, III. S. 20, and XIX-1.	25,300	8,650

The germination in III.S.20 was bad. 1,500 plants in XIX.1 were sown with *nachana*. Germination was however poor on account of an unfavourable season.

In the Dharwar-Bijapur Division, sowing, dibbling, and planting of teak was carried out in suitable exploited areas in the teak pole coupes of the Dharwar district. Teak seed in burnt patches of 50′ × 50′ or larger in exploited coupes was satisfactory. Stump planting was tried in Kalghatgi range with success. Transplanting the seedlings from dry nurseries is also being done and the results are being watched. The percentage of germination of dibbled teak seed was fairly satisfactory. Dibbling of *nim* (*Azadirachta indica*) and other species prepared in pits is introduced on a large scale in Bagalkot and Badami ranges. The results are being watched. Dibbling of sandal seed under lantana

(*Lantana camara*) and other shady bushes in suitable areas was continued with fair success.

Sind Circle.—The sowing of *babul* and *kandi* seed in coupes, *katchas* and blanks was carried out before, during and after inundation, the methods followed being either to dibble or broadcast the seed in patches on mounds, in drills, ploughed lines or trenches. The area taken up for regeneration aggregated 29,885 acres, 3,328 maunds of *babul* and *kandi* seed being utilised for the purpose. 18,353 acres were given out for temporary cultivation in order to prepare the land for tree regeneration during subsequent years.

(*iii*) *Plantation and other forms of regeneration not under working plans or schemes.* (Form No. 62B.)

Northern Circle.—Measures were taken during the year to regenerate suitable areas in West Nasik with teak, *babul*, and sandal and in the unorganised forests of East Nasik *khair*, *babul* and *anjan* were sown in ploughed lines with fair results.

Central Circle.—Satisfactory results were obtained with bamboo raised on *rab* beds in 4 coupes of the Taloda range.

In unorganised forest where no definite scheme of regeneration exists it is found that the agri-cum-forestry system is the best and cheapest means of reboisement. This year excellent results were secured by the plotholders in West Khandesh both in the Nandurbar and Dhulia ranges. In the latter range it was necessary to assign 6 new plots to original plotholders as their old plots are now fully stocked.

One hundred and thirty-one mango plants were successfully raised in the Karla *rai* in the Poona division where also the agri-cum-forestry system is being freely adopted. 221 acres were given out for temporary cultivation and 39 acres were resumed on completion of stocking.

Southern Circle.—In the Kanara Northern Division, patch planting of teak was carried out over an area of about 10 acres in Series V-17 of Dandeli range through the agency of subordinates. About 8,000 teak stumps were planted and the result was fairly satisfactory.

An area of 53 acres was planted up with teak on an intensive scale in the Nagzari valley Series XI–25, the espacement being 12′ × 9′. The plantation is well stocked with strong healthy plants up to a maximum height of 6 feet. In the Kanara Eastern Division, sandalwood planting under lantana and other bushes was done in an area of 12 acres in the Sirsi-Siddapur range. In the Yekkambi and Heggar areas, it can now be stated with certainty that many of the established plants of 3′ to 6′ height are the result of artificial regeneration.

In the Kanara Southern Division, group planting was continued in compartment 12 of Soppinhosalli where 3 groups of 12 acres were planted at a cost of Rs. 65. The groups were larger and the results obtained on the whole were considerably better than last year (1931–32).

In the Kanara Western Division, no new work was done under this head, but the casuarina plantation in the Supa clearing was watered to the end of May 1932. As the cost of this plantation was prohibitive it has now been given up.

In the Belgaum Division, regeneration of sandalwood was done as usual. In Gujnal range, the method of introduction was either by dibbling under bushes in coupes where there were no charcoal kilns or in groups on kiln sites wherever they were available. In the latter case, sandalwood was coupled with "*kassod*" (*Cassia siamea*) and the attendant success was 50 per cent. In some cases *kassod* alone has come up. The condition of the seedlings is quite good. A few of those raised in 1930–31 are 5 feet in height. On the whole the seedlings on the charcoal kiln sites were excellent.

The subjoined table represents the plantation work done in the Patne round by way of agri-cum-forestry :—

Blocks and coupes.	Species.		Condition of plants.
	Teak No.	Sandalwood No.	
VII-19, X-19 and 20 .. .. XI-19, IX-17, XI-20 and XII-20 ..	11,090	1,958	Good.

Sind Circle.—Two acres were added to the existing area of 540 acres of *Tali* (*Dalbergia sissoo*) plantation in the Larkana division at a cost of Rs. 237 including the pay of a mali. 13 acres of the old plantation in Sarhad and Raoti forests of the Mirpur range and Ghotki forest of the Ghotki range in the Sukkur division having failed were written off, leaving a balance of 529 acres at the close of the year. The total expenditure incurred during the year was Rs. 905 as against Rs. 812 in 1931–32. Frost did no damage to the *tali* plantations during the year. The condition of the Newman Tali Plantation is reported to be quite good. Two acres were added to the Bahman Forest Nursery and sown with *tali* and mulberry. Some *shivani* (*Gmelina arborea*) seed was sown in the same nursery with excellent results. This plantation was raised under the supervision of the Divisional Forest Officer, Working Plans. Such thinnings as were necessary were carried out during the year.

(*iv*) *Tending.*

Weeding, cleaning, mulching, thinning, cutting back and all manner of cultural operations were carried out to the extent possible within fund allotments.

(*v*) *General.*

Progressive improvement in planting methods and the bestowal of greater care in selection of suitable sites for artificial regeneration have contributed to the attainment of a high percentage of success throughout the forests of the Presidency including Sind.

In the Northern Circle the plantations of 12 to 15 years ago have not given such good results as those of more recent origin owing to initial inexperience and the injudicious selection of plantation sites. Each year has seen an advance in regeneration technique which has now attained a very satisfactory level.

The Conservator of Forests, Southern Circle, made during the past season a careful survey of most of the recently planted areas, and is personally of the opinion that too much encouragement has been given in the past to the admixture of junglewoods with teak. As there is considerable divergence of opinion on this subject he proposes to continue to allow each Divisional Forest Officer complete freedom in the conduct of planting operations and after the lapse of a few years the Circle will be in possession of a number of plantations each created in a slightly different manner and subjected subsequently to slightly different methods of treatment. A careful comparison may then show what is the best method to follow.

2. Tending of the Growing Stock.

Cultural operations comprising cleanings, thinnings and other tending operations were undertaken in accordance with the prescriptions of working plans in organised forests and in accordance with the principles of silviculture in unorganised areas.

Northern Circle.—Experimental cleanings were carried out in 4 coupes in the Panch Mahals and, combined with light thinnings, in the plantations of West Nasik. In the Dangs all inferior species interfering with teak and the more valuable junglewoods were cut out departmentally in coupes one year ahead of the main fellings.

Thinnings were also carried out in accordance with the provision of the working plan in 33 coupes of the North Thana Division, 26 coupes of the East Thana Division and 38 coupes of the West Thana Division. The coupes in the North and East Thana Divisions were worked by purchasers, the sale price realised for the coupes in the former division being Rs. 3,578 and that in the latter division being Rs. 2,007. In the West Thana Division 21 coupes were sold standing for Rs. 2,548 and 9 were worked departmentally at a cost of Rs. 292–8–0 the resultant material being sold for Rs. 549–8–0. The rest viz. 8 being unsaleable were worked by villagers the resultant material being given to them free in lieu of payment. This work must be done at all costs as the future conditions of the crop is dependent on its skilful execution.

In addition to the above teak and injaili standards over 42″ in girth were marked in 56 coupes in the North Thana Division and sold to purchasers for Rs. 78,943. Under the new plan this operation will be termed the II thinning and excess standards will be removed while the required silvicultural thinning is being carried out in the 35 year old coupes.

A third thinning is indicated for the 65 year coupes but the staff is already overburdened with work. In the opinion of the Conservator the cost of the necessary increase of staff to cope with this work would be well covered by the additional revenue realised.

The results of thinning operations are given below :—

Division.	Agency.	Cost.	Revenue realised from cut material.
		Rs. a. p.	Rs. a. p.
Panch Mahals	Departmental ..	800 0 0	2,259 0 0
Surat (Mandvi, Bulsar, Chikhli)	Do. ..	306 10 0	519 0 0
North Thana 33 coupes ..	Purchasers ..	....	3,578 0 0
East Thana 26 coupes ..			2,007 0 0
West Thana 38 coupes ..	21 coupes by purchasers.		2,548 0 0
	9 coupes by departmental agency.	292 8 0	549 8 0
	8 coupes by villagers.	Material was given free in lieu of labour.	
North Thana removal of over mature standards in 56 coupes.	Purchasers ..	....	78,943 0 0
North Thana Casuarina plantations (Thinnings).	Do. ..	....	40 0 0

Central Circle.—15 coupes in the Nawapur and Chinchpada ranges, West Khandesh and 127 coupes in Kolaba were subjected to cleanings while soft woods and inferior species interfering with teak and other valuable trees were felled in East Khandesh, North Khandesh and Satara. In Poona dead and dying trees were collected in the babul areas at a cost of Rs. 2,073, the resultant material being sold for Rs. 8,156.

Out of 78 coupes due for thinning in the Kolaba division 68 were worked, 5 coupes did not require thinnings, 2 were included in the coupes already worked under the present working plan and 3 remained untreated. One coupe in the Alibag casuarina plantation was thinned and the resultant material sold for Rs. 80.

Southern Circle.—Thinnings were carried out as under :—

Division.	Area Acres.	Cost incurred.	Revenue.
		Rs.	Rs.
Kanara Northern Division—			
1. (Haliyal and Sambrani Ranges—Teak Pole area).	621	126	398
2. (Sambrani, Virnoli and Kulgi ranges—High Forest young plantations).	1,063	2,011	5,356
3. (Dandeli range—High Forest old Shingatgeri plantation—VII-18).	45	4,130	12,365
Kanara Eastern Division.—			
Mundgod Teak Pole—Blocks I-4, II-6, III-4 and 5, IV-7 and 20, V-8, VI-9, 20 and 21, VII-8, VIII-8, IX-7, 8, 9, X-7, 8 and 9 and XI-7, 8 and 9. Revised Working Plan XII-4/A and 8A, Kirwatti XV-1 and XI-4A.	....	276	309

Division.	Area Acres.	Cost incurred.	Revenue.
Kanara Southern Division—		Rs.	Rs.
1. Casuarina Blocks	58	....	505
2. Special thinnings in old plantations ..	399	97	116
Kanara Western Division—			
1. 1917–18, 1919 and 1921 plantations in Gund.	165	223	83*
2. Old plantations in Kadra range ...	28	....	33
3. 1926 plantation in Karwar range (near Gopshitta).	....	....	4
4. Aveda plantation in Supa range† ..	....	....	....
5. First thinning in 5 year old and second thinning in 10 year old casuarina plantations at Arghe and	14	....	....
6. at Arghe and Chitakule respectively (sold standing).	30	....	600
Belgaum Division—			
1. Teak Pole Blocks I, II and III coupes Nos. 45, 45, 44 and 45 respectively (sold standing).	....	....	335
2. Maskenhatti coupes—5 and 6 of Block I.	....	....	....
Dharwar-Bijapur Division—			
4. Thinning coupes in Dharwar Teak Pole Blocks and 9 coupes of Kalghatgi Teak Pole Blocks sold standing.	....	....	763

*Only 356 poles were cut.

†A demonstration thinning carried out by the Divisional Forest Officer with one Forester and 2 Guards.

Arrears of thinnings have now been worked off, and will not be permitted to recur. It will be noted that in almost every case these early thinnings gave a satisfactory surplus. The surplus realised from Shingatgeri old plantation, a net revenue of Rs. 180 per acre is remarkable, for this plantation is not of first class quality.

Sind Circle.—Thinnings were carried out in all divisions, and chiefly consisted of the removal of suppressed, dead and fallen stems and branchwood, the result of which was silviculturally desirable. This is a useful operation but does not go far enough, as far heavier thinnings are really necessary than has been the custom in the past if any real benefit is to accrue. Thinnings and cleanings were also made in the *tali* plantations of the Sukkur and Shikarpur divisions and such thinnings are now seen to be necessary annually.

The area dealt with, material obtained, and the value realised from thinnings are given below :—

Division.	Area.	Gross revenue.	Net revenue.
	Acres.	Rs.	Rs.
Sukkur	1,205	8,048	8,048
Shikarpur	430	2,724	2,724
Larkana	1,792	3,382	3,382
Hyderabad	1,849	14,952	14,952
Karachi	700	2,629	2,629
Total ..	5,976	31,735	31,735

CHAPTER IV.

EXPLOITATION.

(*a*) System of Management.

(*i*) *Major Forest Produce.*

Form No. 55B (*vide* Volume II of this Report) shows the areas in which various systems are in force.

Clear fellings.—These were carried out in the three Thana divisions in the Panch Mahals division (with limited reservation of a few valuable species), in selected areas in all ranges in the Dangs, in Bulsar-Chikhli forests, in the aboveghat forests of the West Nasik division and in the teak felling circles of the East Nasik division in the Northern Circle ; in the teak pole areas of the North, East and West Khandesh divisions, in the teak and casuarina coupes of the Kolaba divisions and *babul* forests of Poona and East Khandesh divisions in the Central Circle ; in the teak pole forests of the Southern Circle generally, as also in areas selected for regeneration in the high forests of Kanara and Belgaum, the annual coupes of the revised Inland Coastal Plan in Kanara Southern division, casuarina coupes in Kanara Western division and throughout the Sind forests.

Coppice with standards.—Fellings of this nature took place in the scrub forests of the East Nasik division ; in the Satpuda forests and *anjan* areas of East and North Khandesh divisions and the teak forests of the Satara division ; and in some parts of the Belgaum division.

Improvement fellings.—These were carried out in the Mandvi forests and in selected areas in all ranges in the Dangs ; in some coupes of East and West Khandesh divisions, Matheran and Mahableshwar forests and in the high forests of Kanara and Belgaum divisions as prescribed by working plans.

Selection fellings.—These were carried out in the Dangs Protected forests, Peint and adjoining belowghat forests of Nasik and Dindori ranges and the Thana Gurcharans, in some *anjan* coupes of West Khandesh division and in certain high forests of Kanara and Belgaum.

Simple coppice fellings were carried out in the annual coupes of the North Kanara Coastal Fuel Plan and in the scrub forests of the Dharwar-Bijapur division.

Unregulated fellings.—These comprise fellings of trees in lands given out for cultivation, fellings of matchwood species, clearing of grazing grounds, felling of royalty trees in malki lands, reserved trees in Revenue Waste lands and of trees for free grants, permits etc., and in Sind, cutting of dead and wind fallen trees and clearance of erosion strips.

(*ii*) *Minor Forest Produce.* (Form No. 64.)

No changes were made in the methods of disposing of minor forest produce.

119 khandies of *hirda* were collected departmentally on the share system in the Poona division at a cost of Rs. 1,663 and were sold for Rs. 4,284. In addition to this a sum of Rs. 157 was recovered on account of last year's dues.

The farm of *mhowra* flowers was not sold in West Khandesh division as the question of giving over the right of collection of this commodity from forest areas to the Excise Department on payment of a fixed royalty is under consideration.

Minor produce farms of Karwar, Kadra and Gund ranges of the Kanara Western division could not be sold for want of offers. The same was the case in respect of *tarwad* (*Cassia auriculata*) bark in the Belgaum division. Owing to severe trade depression, *tarwad* (*Cassia auriculata*) and *kakkai* (*Cassia fistula*) barks had to be sold for a nominal value in the Dharwar-Bijapur division. It is reported that the Australian barks successfully compete with the indigenous product in the Madras market.

Owing to the continued slump in the manganese market, very little ore was removed by the lessees in Supa range in the Kanara Western division.

(*b*) Agency of Exploitation.

(*i*) *Departmental agency.*

The following is a comparative statement of major and minor forest produce extracted departmentally during two years 1932–33 and 1931–32 :—

Circle.	Year.	Major Forest Produce.			
		Timber cft. in thousands.	Fuel cft. in thousands.	Total cft. in thousands.	Sandal-wood value.
					Rs.
Northern	1932–33 ..	240	86	326	..
	1931–32 ..	425	513	938	..
Central	1932–33 ..	17	541	558	4,201
	1931–32 ..	16	458	474	4,747
Southern	1932–33 ..	887	5	892	1,02,392
	1931–32 ..	931	6	937	1,28,467
Sind	1932–33 ..	3	92	95	..
	1931–32 ..	6	314	320	..
Total ..	1932–33 ..	1,147	724	1,871	1,06,593
	1931–32 ..	1,378	1,291	2,669	1,33,214
Difference		—231	—567	—798	—26,621
Percentage of total outturn from all sources ..		16	2	4	100

Circle.	Year.	Minor Forest Produce.			
		Bamboos value.	Grass and grazing value.	Other value.	Total value.
		Rs.	Rs.	Rs.	Rs.
Northern	1932–33 ..	56	..	64	120
	1931–32 ..	38	..	18	56
Central	1932–33 ..	..	..	4,514	4,514
	1931–32 ..	..	..	5,717	5,717
Southern	1932–33 ..	..	..	129	129
	1931–32 ..	..	..	133	133
Sind	1932–33 ..	..	..	1,991	1,991
	1931–32 ..	..	..	935	935
Total ..	1932–33 ..	56	..	6,698	6,754
	1931–32 ..	38	..	6,803	6,841
Difference		+18	..	—105	—87
Percentage of total outturn from all sources ..		..	..	4	·4

In the Northern Circle the decrease both under timber and fuel was due partly to the suspension of work at Sundha sawmill for about four months, which was done to relieve the congestion in the timber stock, and partly to fewer thinning coupes worked departmentally in Thana.

The increase under timber in the Central Circle was mainly due to more material being extracted in silvicultural operations in the North Khandesh and Kolaba divisions. The increase under fuel was due to increased exploitation of *babul* trees in Poona and to a larger quantity of firewood extracted for sale at Malcompeth and Panchgani fuel depôts. The decrease under sandalwood was due to fewer sandal trees having been exploited from malki lands and that under minor produce to reduced prices realised for *hirda* collected in the Poona division.

In the Southern Circle the decrease in the outturn of timber brought to sale depôts was due to an overstock of timber at several depots, the disposal of High Forest Compartments of the Bhagwati Working Plan area in the Kanara Northern division by standing sale, failure of some of the High Forest contractors to deliver the required quantity of timber at the sale depôt at Dandeli and also due to the selection fellings in the Kanara Southern division being held over on account of the accumulation of timber at Hattikeri depôt.

Except in the Kanara Northern division where fuel was extracted for the use of the Foden mill, no fuel was extracted departmentally. No fuel was supplied to the Dandeli mill during the year under report and this accounts for the decrease in the quantity under "Fuel".

The general depression in the market is responsible for the fall in revenue from sandalwood. The depression is believed to be caused in part by competition of Australian sandalwood in the Indian market.

In the Sind Circle, the decrease under timber was due to there being no demand for *babul* logs from the Gun Carriage Factory, Jubbalpore, and that under fuel to curtailed departmental operations on account of the slump in the fuel market.

Timber depôts.—The average prices realised at the annual depôt sales in the Northern and Southern Circles are compared in the following tables :—

Northern Circle.

Kind of timber.	Average rate per khandi of 12·50 cft.			
	Waghai depôt (Chikhalda and Sundha sawmills).		Nasik Road depôt (Haste mill).	
	1932–33	1931–32	1932–33	1931–32
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Boards ..	17 0 11	20 0 10	25 4 2	19 1 2
Battens ..	11 12 6	15 14 2	14 2 0	14 7 3
Scantlings ..	17 0 11	19 4 4	25 8 4	24 9 9

Southern Circle.

Kind of timber.	Average rate per khandi of 12·50 cft.			
	Dandeli depôt.		Kodibag depôt.	
	1932–33	1931–32	1932–33	1931–32
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Teak	24 4 9	23 11 11	24 11 2	22 15 8
Matti	12 12 5	13 5 8	16 9 3	15 1 0
Nana	11 6 2	13 8 6	....	....
Honne	13 8 11	14 10 1	15 0 8	14 13 11
Sissum	12 7 3	14 15 7	20 12 1	21 6 10
Karimuttal	....	13 11 6	....	....
Heddi	10 8 6	11 1 2	....	....
Other jungle woods ..	10 7 11	10 15 7	....	....
Teak scantlings	23 1 9	24 13 11	....	....
Teak planks	35 4 7	32 13 0	....	....
Teak battens	18 1 7	19 13 8	....	....

Kind of timber.	Average rate per khandi of 12·50 cft.			
	Hattikeri depôt.		Kirwatti depôt.	
	1932–33	1931–32	1932–33	1931–32
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Teak	23 15 3	23 3 3	20 1 8	16 15 7
Matti	15 2 3	16 8 0	11 0 10	10 15 6
Nana	....	....	12 6 3	13 2 3
Honne	12 6 6	15 0 0	11 13 1	12 4 10
Sissum	18 12 0	15 14 3	....	....
Karimuttal	....	....	16 4 0	14 8 8
Heddi	....	....	....	8 10 1
Other jungle woods ..	....	....	8 15 9	....
Teak scantlings	....	....	21 4 7	24 0 4
Teak planks	....	....	25 0 0	26 2 9
Teak battens	....	....	16 1 3	15 8 11

The moderate prices realised were due mainly to continued trade depression.

Firewood depots.—All depôts in the Northern Circle including the one at Trimbak were worked through the agency of contractors. The fuel depôt at Malcolmpet (Mahableshwar) was managed departmentally while the Panchgani depôt was worked by a contractor. The latter

depôt was supplied with material cut departmentally. All the firewood depôts in Kanara were worked by contract agency.

Mechanical extraction and Government sawmills are dealt with in Chapter IV-A.

Private sawmills.—The sawmill belonging to Mr. Sayad Nasrodin Hussansab, forest contractor in Kanara Eastern Division, turned out 7,683 sleepers and 8,719 cubic feet of sawn material as compared with 8,187 sleepers and 2,461 cubic feet of sawn material last year.

Messrs. Howard Brothers' Timber Agency.—The account with this Firm to the end of the financial year is given below :—

Kind of timber.	Receipts.	Disposals.	Balance in stock.	Sale proceeds.
	Cft.	Cft.		£ s. d.
Teak	22,616	22,616	..	
Matti	11,419	11,419	..	
Blackwood or Rosewood ..	T. c. q. lbs. 29 4 3 3	T. c. q. lbs. 29 4 3 3	..	13,551 12 0
Honne	Cft. 78	Cft. 78	..	

Kind of timber.	All charges on sales.	Other charges, freight charges, etc.	Net proceeds.
	£ s. d.	£ s. d.	£ s. d.
Teak			
Matti			
Blackwood or Rosewood ..	2,106 9 8	6,820 17 8	4,624 4 8
Honne			

On auditing the accounts of this Firm by the High Commissioner for India it was found that a stock of about 14,200 feet super of veneers remained unsold. Attempts were made to dispose of this material but owing to prevailing trade conditions no offer was obtained. At the recommendation of the High Commissioner and under sanction from the Government of Bombay (*vide* G. R., R. D., No. 4206/24, dated 4th May 1933) this stock was written off and the account with the Firm closed.

No shipments of timber were made to London or other foreign port during the year.

(ii) Purchasers.

The following table compares the outturn of major and minor produce removed by consumers and purchasers during the years 1932–33 and 1931–32 :-

Circle.	Year.	Major Forest Produce.				
		Timber.		Fuel.		Sandalwood.
		Cft. in thousands.	Value.	Cft. in thousands.	Value.	
			Rs.		Rs.	
Northern ..	1932–33 ..	2,844	15,57,327	6,223	25,093	..
	1931–32 ..	2,523	13,19,424	6,695	24,963	..
Central ..	1932–33 ..	1,115	3,21,684	4,307	52,646	..
	1931–32 ..	1,052	2,96,995	8,452	53,964	..
Southern ..	1932–33 ..	1,536	2,75,389	5,358	1,55,796	..
	1931–32 ..	1,243	2,52,134	5,281	1,52,111	..
Sind ..	1932–33 ..	301	58,475	16,045	2,20,547	..
	1931–32 ..	250	48,829	16,165	2,56,384	..
Total ..	1932–33 ..	5,796	22,12,875	31,933	4,54,082	..
	1931–32 ..	5,068	19,17,382	36,593	4,87,422	..
Difference ..	....	+ 728	+ 2,95,493	— 4,760	— 33,340	..

Circle.	Year.	Minor Forest Produce.			
		Bamboos, value.	Grass and grazing, value.	Other minor produce, value.	Total value.
		Rs.	Rs.	Rs.	Rs.
Northern ..	1932–33 ..	64,937	1,45,377	31,300	2,41,614
	1931–32 ..	63,193	1,35,266	32,895	2,31,354
Central ..	1932–33 ..	15,164	3,80,685	31,480	4,27,329
	1931–32 ..	14,016	3,88,152	34,561	4,36,729
Southern ..	1932–33 ..	74,207	87,226	31,033	1,92,466
	1931–32 ..	67,612	89,548	53,159	2,10,319
Sind ..	1932–33 ..	....	46,888	17,796	64,684
	1931–32 ..	....	42,521	14,650	57,171
Total ..	1932–33 ..	1,54,308	6,60,176	1,11,609	9,26,093
	1931–32 ..	1,44,821	6,55,487	1,35,265	9,35,573
Difference ..	....	+ 9,487	+ 4,689	— 23,656	— 9,480

In the Northern Circle timber coupes fetched good prices particularly in the Surat division. Some arrear coupes were sold in the Surat, Panch Mahals and West Nasik divisions and the thinning coupes in the North Thana division were sold to purchasers instead of being worked departmentally. These were the causes leading to an increase in the outturn and value of timber. The decrease under fuel was due to non-sale of some thinning and other coupes in the East Thana division for want of demand. The increase under bamboos was due to greater demand in the Surat division and that under grass and grazing to vigilance exercised in collecting grazing fees. The poor prices realised for *tumri* leaves and the suspension of manganese operations in the Panch Mahals division account for the decrease under other minor produce.

In the Central Circle more timber and less fuel were extracted from coupes sold during the year, particularly in the Kolaba division. Better prices were obtained for coupes in the West Khandesh, Poona and Kolaba divisions. The increase under bamboos was due to the greater number of bamboos removed on permits in the East and North Khandesh division. Fewer sheep and goats came to the West Khandesh division for grazing and this accounts for the decrease under this head. General trade depression was mainly responsible for the decrease under other minor produce.

In the Southern Circle the increase in the value of timber and fuel was due to better prices obtained for coupes in Kanara Northern Division, Belgaum and Dharwar-Bijapur divisions. The sale of rejected material from 25 compartments in Kanara Northern division also resulted in additional revenue. The quantity of timber and fuel extracted by contractors was more than in the previous year. Greater demand for bamboos, particularly in Kanara Northern division, resulted in an increase in the value. There were no arrear grazing fees to be recovered as was the case last year and this fact was mainly responsible for decreased receipts under grass and grazing. The fall under other minor produce was due chiefly to a large decrease in the revenue from the *hirda* farms of Belgaum and Supa and from the *tarwad* and *kakkai* bark farms which latter were sold for a nominal sum owing to bad trade conditions.

In the Sind Circle the increase in outturn and value of timber was due to exploitation of *bahan* coupes and to thinnings carried out in *tali* plantations. The decrease in quantity and value of fuel was due to the withholding from sale of certain coupes in the Sukkur and Shikarpur divisions. Owing to the depressed conditions of trade many contractors had more than 2 years stocks in hand. In order to lessen the congestion in the fuel market and to facilitate the sale of the remaining coupes it was necessary to limit output by withholding some of the regular coupes from the market. The increase under grass and grazing was due to the larger number of cattle registered for grazing and that under other minor produce to an increased supply of brushwood and grass to the Public Works Department in the

Larkana division and to the *babul* pod farm having been sold to contractors in Karachi division instead of being worked departmentally.

(*iii*) *Rights, Privileges and Free grants.*

The following is a comparative statement of the quantity and value of forest produce removed by right and privilege holders and free grantees during the years 1932–33 and 1931–32 :—

Circle.	Agency.	Major Forest Produce.				Minor Forest Produce.			
		Timber.		Fuel.		Bamboos value.	Grass and grazing value.	Other minor produce value.	Total value.
		Cft. in thousands.	Value.	Cft. in thousands.	Value.				
			Rs.		Rs.	Rs.	Rs.	Rs.	Rs.
Northern	C	..	..	4,544	99,100	4,976	5,05,935	9,806	5,20,717
	F	20	9,211	1	20	303	..	114	417
Central	C	1	368	708	28,239	..	37,595	8,798	46,393
	F	24	8,782	1	61	724	1,525	923	3,172
Southern	C	300	72,000	3,000	37,500	45,000	2,84,339	20,000	3,49,339
	F	33	7,862	14	385	377	3,684	920	4,981
Sind	C	..	..	1	6	..	7,408	..	7,408
	F	29	3,320	3	49	..	24,910	140	25,050
Total	C	301	72,368	8,253	1,64,845	49,976	8,35,277	38,604	9,23,857
	F	106	29,175	19	515	1,404	30,119	2,097	33,620
Total of 1931–32	C	323	73,139	7,999	1,43,346	49,784	8,46,748	44,181	9,40,713
	F	94	25,980	37	1,637	2,107	21,071	2,594	25,772

C=Concessionists. F= Free grantees.

There are no rights except those of way. Privileges were enjoyed as usual as prescribed by the Forest Settlements, local rules and other Government orders.

Free grants of timber and other produce were given in deserving cases for reconstruction of houses burnt by fire, for domestic and agricultural purposes and also for works of public utility such as temples etc. Arrangements to supply free timber of the value of Rs. 1,500 and prepared specimens valued at Rs. 500 to the Lord Reay, Industrial Museum, Poona, are still in progress.

Under Government Resolution, Revenue Department, No. 4433/28, dated 13th December 1932, the Bhils of Dohad taluka and Jhalod mahal and Naikdars of Halol mahal in the Panch Mahals division have been granted the privilege of removing dead wood in headloads from reserved forests for sale to the public.

(c) Outturn and Sources of Forest Produce.

The outturn from all sources of forest produce during the two years 1932-33 and 1931-32 compares as follows :- -

Circle.	Year.	Major Forest Produce.			Minor Forest Produce.		
		Timber cft. in thousands.	Fuel cft. in thousands.	Sandal-wood	Bamboos.	Grass and grazing.	Other minor produce.
				Rs.	Rs.	Rs.	Rs.
Northern	1932-33 ..	3,104	10,854	..	70,272	6,51,312	41,234
	1931-32 ..	2,978	11,685	..	68,168	6,41,700	47,824
Central	1932-33 ..	1,157	5,557	4,201	15,888	4,19,805	45,715
	1931-32 ..	1,090	9,440	4,747	15,378	4,38,015	51,178
Southern	1932-33 ..	2,756	8,377	1,02,392	1,19,584	3,75,249	52,082
	1931-32 ..	2,512	8,309	1,28,467	1,13,204	3,79,190	74,041
Sind	1932-33 ..	333	16,141	..	..	79,206	19,927
	1931-32 ..	283	16,486	..	..	64,401	15,800
Total	1932-33 ..	7,350	40,929	1,06,593	2,05,744	15,25,572	1,59,008
	1931-32 ..	6,863	45,920	1,33,214	1,96,750	15,23,306	1,88,843
Difference ..		+ 487	−4,991	−[26,621	+ 8,994	+ 2,266	−29,835

The total expenditure on management of State Forest was :—

Circle.	1932-33.	1931-32.
	Rs.	Rs.
Northern	2,81,415	2,66,142
Central	65,807	65,444
Southern	9,36,346	11,86,418
Sind	18,330	26,350
Total ..	13,01,898	15,44,354

The decrease is chiefly due to curtailment of expenditure on departmental operations, particularly in the Southern Circle, owing to accumulation of timber at sale depôts.

CHAPTER IV-A.

FOREST ENGINEERING BRANCH.

The following works were carried out through the agency of the Forest Engineering Branch :—

1. Surveys.

A revision survey and preparation of land acquisition plans for the Ozhar-Saiwan road (North Thana and West Nasik divisions) were carried out during the season.

Revised-Type-Design Bridge over Birkhol Nala in W. D. Kanara.
Cost Rs. 6,400.

2. Designs and Drawing Work.

Plans and estimates submitted by Divisional Forest Officers were checked and scrutinized while standard and special plans and estimates were supplied on demand to several divisions.

3. Construction.

(*a*) *Roads.*—The following construction work and repairs were carried out :—

	Rs.	a.	p.
1. Completion of the Birkhol bridge ..	2,900	0	0
2. Remodelling of culverts on the Kadra-Shivpur road	2,846	0	0
3. Current repairs to—			
(1) culverts on the Kadra-Shivpur road ..	450	0	0
(2) the Tamange ghat road	1,900	0	0

The bridge over the Birkhol nala, a photograph of which appears opposite was completed at a total cost of Rs. 6,400.

(*b*) *Buildings.*—An outhouse in the compound of the Forest Rest House at Gund was constructed according to the new design referred to in last year's report. Instead of lime masonry, asbestos cement sheets have been used as walling, reducing the cost from Rs. 3,200 to Rs. 2,500.

Repairs to the quarters of the engineering staff, the stores shed and water reservoir at Dandeli cost Rs. 792.

4. Forest Exploitation.

(*a*) *Mechanical extraction.*

(*i*) *Fordson outfit.*—Both the Fordson outfits were at work in Gund on the Kaneri slopes in Block XI compartment 14 and Block X compartments 16, 17 and 10, the total output amounting to 1,344·16 tons against 1,067·23 tons last year.

Extraction costs including all charges worked out at Rs. 11-9-0 per ton with a mean length of haul of 1,314 feet as compared with Rs. 7-7-0 per ton and 1,057 feet length of haul last year. The increase in cost is attributed to several factors the chief of which are the rocky nature of the ground, increase in length of haul and fewer working days.

Owing to excess of stocks at depôts no mechanical skidding was carried out in the Nagzari valley.

(*ii*) *Animal winch.*—The animal winch worked in compartment 26, Felling series XI of Nagzari valley under the control of the Divisional Forest Officer, Northern Division Kanara, from 1st April to 18th May 1933.

It extracted 159·31 tons of timber and 64·22 tons of sleeper pieces against a total of 494·56 tons last year, the average haul being

487 feet compared with 626 feet last year. Working costs inclusive of all charges worked out to Rs. 9–8–0 against Rs. 10–2–0 last year.

(b) Sawmilling.

1. *Preliminary.*—During the year there were 5 sawmills at work at the following places :—

Northern Circle ..	.. 1. The Dangs sawmill at Sundha.
Southern Circle ..	.. 2. The Dandeli sawmill at Dandeli, Northern Division Kanara.
	3. The Foden Portable sawmill at Bomanhalli, Northern Division Kanara.
	4. The Mandurli sawmill at Mandurli, Northern Division Kanara.
	5. The Kirwatti sawmill at Kirwatti, Eastern Division Kanara.

2. *General.*—The total output and average cost of conversion are given for the last 5 years in the subjoined statement :—

Year.	Output of sawn material.	Average cost of conversion taking into account cost of stores, labour and establishment charges excluding overhead charges.
	Cft.	
1928–29 ..	334,753	5·42 annas per cft. of sawn timber.
1929–30 ..	312,453	4·96 annas per cft. of sawn timber.
1930–31 ..	326,450	4·48 annas per cft. of sawn timber.
1931–32 ..	332,616	4·16 annas per cft. of sawn timber.
1932–33 ..	286,796	4·01 annas per cft. of sawn timber.

The reduction in output is accounted for by the fact that there was one mill less in operation, the Peint sawmill having closed down last year. Moreover the Dangs mill on account of shortage of raw material remained idle from 16th June to the 15th October 1932 while the Mandurli mill worked only during a part of the fair season, i.e. from the 1st April to the end of May 1932.

Sawing costs, however, owing to efficient organisation show an appreciable reduction in spite of reduced output.

3. *Deadstock and stores.*—The deadstock of each sawmill was checked, unserviceable articles being either repaired or written off under proper authority.

The total value of stores and deadstock supplied to the mills was Rs. 6,943 and 16,569 respectively.

4. *Progress of sawmilling.*—The Foden mill at Bomanhalli was temporarily closed down on the 29th March 1933 and while the engine which was not giving satisfactory service was being overhauled, the mill establishment was transferred for work to the Mandurli mill. Statement A below shows the outturn and average sawing charges incurred under the heads stores, labour and establishment excluding overhead charges.

TABLE A.

Name of Mill.	Output during the year.			Average sawing cost per cft.		
				Stores.		
	1930–31.	1931–32.	1932–33.	1930–31.	1931–32.	1932–33.
1	2	3	4	5	6	7
	Cft.	Cft.	Cft.			
Dandeli Mill ..	113,466	133,166	127,758	0·92	0·72	0·83
Foden Potable ..	34,446	42,824	43,642	1·28	0·76	0·75
Kirwatti Mill ..	53,337	51,058	59,983	0·72	0·68	0·64
*Haste Mill ..	59,571	30,737	Closed down.	0·81	0·46	Closed down.
†Dangs Mill ..	65,630	54,625	46,058	1·22	1·53	1·74
‡Mandurli Mill ..	....	20,206	9,355	....	0·98	0·76
Total for Presidency	326,450	332,616	286,796	0·94	0·85	0·92

Name of Mill.	Average sawing cost per cft.—*contd.*						Total excluding overhead charges per cft.		
	Labour.			Establishment.					
	1930–31.	1931–32.	1932–33.	1930–31.	1931–32.	1932–33.	1930–31.	1931–32.	1932–33.
	8	9	10	11	12	13	14	15	16
Dandeli Mill ..	3·78	3·09	2·90	0·61	0·51	0·52	5·31	4·32	4·25
Foden Potable ..	2·33	1·84	1·97	1·02	0·82	0·76	4·63	3·42	3·48
Kirwatti Mill ..	2·45	2·88	2·39	0·47	0·43	0·30	3·64	3·99	3·33
*Haste Mill ..	1·80	2·21	Closed down.	0·56	0·49	Closed down.	3·17	3·16	Closed down.
†Dangs Mill ..	2·83	2·95	2·45	0·90	1·03	0·82	4·95	5·51	5·01
‡Mandurli Mill ..	..	1·65	1·45	..	0·38	0·40	..	3·01	2·61
Total for Presidency	2·86	2·70	2·53	0·68	0·61	0·56	4·48	4·16	4·01

* This mill was closed down on 1st November 1931.
† This mill was closed on account of shortage of timber from 16th June to 15th October 1932.
‡ This mill was closed down on 30th May 1932.

Organisation.—No further progress for want of funds could be made with the proposed revision of the layout of the Dandeli sawmill.

Mill Trading Accounts.—The audit branch of the Accountant General's office audited the trading accounts of the Dandeli sawmill and the stores account of the Forest Engineering Division for the year 1931–32.

The following are the trading accounts of the sawmills :—

Trading account of the Sundha Sawmill for the year 1932–33.

Capital cost Rs. 66,769 *plus* 44 = 66,813 - - 40,180 = 26,633.

Expenditure.		Income.		
	Rs.		Rs.	Rs.
I. Timber (unconverted) 95,982 cft. at 0·2·6 per cft.	14,997	I. Sales—		
		Sales of sawn material during the year 92,850 cft.	1,34,256	
II. General stores ..	4,987			
III. Establishment ..	8,557	*Less*—		
		Stock of sawn material at the end of the previous year 73,484 cft.	—80,017	
IV. Labour	4,130			
V. Depreciation on capital cost.	3,306			
VI. Interest on capital cost.	6,195		54,239	
VII. Repairs to buildings ..	9,557	*Add*—		
		Stock of sawn timber on 31st March 1933 26,092 cft.	20,381	
VIII. Miscellaneous ..	38			83,620
Net profit for the year ..	31,903	II. Miscellaneous receipts ..		50
	83,670			83,670

Trading account of Dandeli Sawmill for the year 1932–33.

Capital cost Rs. 1,04,756 *plus* 5,075 - - 12,378 = 97,453 — 46,869 = 50,584.

Expenditure.		Income.		
	Rs.		Rs.	Rs.
I. Timber (unconverted) 100,390 cft.	1,25,228	I. Sales—		
		Sale of sawn timber during the year 109,390 cft.	2,32,365	
II. General stores ..	5,305			
III. Establishment ..	5,007			
IV. Labour	28,815	*Less*—		
		Stock of sawn material at the end of the previous year 58,245 cft.	—80,998	
V. Depreciation on capital cost.	3,771			
VI. Interest on capital cost.	7,085		1,51,367	
VII. Repairs to buildings ..	1,802	*Add*—		
VIII. Miscellaneous ..	227	Stock of sawn material at the end of the year 70,613 cft.	106,141	
Net profit for the year ..	80,906			2,57,508
		II. Miscellaneous ..		638
	2,58,146			2,58,146

Trading account of Bomanhalli Foden Portable Sawmill for the year 1932–33.

Capital cost Rs. 21,104 *plus* 20 = 21,124 — 10,423 = 10,701.

Expenditure.	Rs.	Income.	Rs.	Rs.
I. Timber (unconverted) 70,092 cft.	22,051	I. Sales— Sale of sawn timber during the year 42,279 cft.	80,956	
II. General stores ..	1,976			
III. Establishment ..	720			
IV. Labour	8,729	*Less*— Stock of sawn timber at the end of the previous year 35,483 cft.	—34,744	
V. Depreciation on capital cost.	1,059			
VI. Interest on capital cost.	2,486		46,212	
VII. Repairs to buildings ..	348	*Add*— Stock of sawn timber at the end of the year 36,846 cft.	37,422	
VIII. Miscellaneous ..	7,291			83,634
Net profit for the year ..	39,251	II. Miscellaneous ..		277
	83,911			83,911

Trading account of Mandurli Sawmill for the year 1932–33.

Capital cost Rs. 16,194 *plus* 28 — 28 = 16,194 — 8,078 = 8,116.

Expenditure.	Rs.	Income.	Rs.	Rs.
I. Timber (unconverted) 12,200 cft.	3,631	I. Sales — Sale of sawn timber during the year 29,554 cft.	58,965	
II. General stores ..	348			
III. Establishment ..	239	*Less*— Stock of sawn timber at the end of the previous year 20,206 cft.	—18,254	
IV. Labour	1,624		40,711	
V. Depreciation on capital cost.	782			
VI. Interest on capital cost.	1,876	*Add*— Stock of sawn timber at the end of the year 7 cft.	10	
VII. Repairs to buildings ..	1,924			
VIII. Miscellaneous ..	1,745			40,721
Net profit for the year ..	28,552	II. Miscellaneous ..		....
	40,721			40,721

Trading account of Kirwatti Sawmill for the year 1932-33.

Capital cost Rs. 21,328 *plus* 127 — 68 = 21,387 — 13,888 = 7,499.

Expenditure.	Rs.	Income.	Rs.	Rs.
I. Timber (unconverted) 106,108 cft.	35,250	I. Sales—		
II. General stores ..	2,109	Sale of sawn timber during the year 70,199 cft.	1,28,311	
III. Establishment ..	1,623			
IV. Labour	11,431	*Less*— Stock of sawn timber at the end of the previous year 26,846 cft.	—29,363	
V. Depreciation on capital cost.	827		98,948	
VI. Interest on capital cost.	2,079			
VII. Repairs to buildings ..	18	*Add*— Stock of sawn timber at the end of the year 16,630 cft.	16,630	
VIII. Miscellaneous ..	6,880			1,15,578
Net profit for the year ..	55,909	II. Miscellaneous ..		548
	1,16,126			1,16,126

The four sawmills of the Southern Circle show a net profit of Rs. 2,04,618 as against Rs. 1,31,796 last year while the Sundha sawmill in the Northern Circle has shown a profit of Rs. 31,903 as compared with Rs. 12,174 in the previous year. There has been a substantial improvement in the financial results of all the sawmills as compared with the preceding year.

CHAPTER V.

FINANCIAL RESULTS.

(Forms Nos. 68, 69 and 70.)

The revenue and expenditure of the year compared with those of the last year and the average of the previous quinquennium 1927–28 to 1931–32 as follows :—

Circle.	Year.	Revenue.	Expenditure.				Surplus or deficit.	Percentage of surplus to gross revenue.
			Conservancy, Maintenance and Regeneration.	Forest Capital outlay.	Establishment.	Total.		
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Northern	1932–33	22,16,217	2,32,573	70,105	6,44,917	9,53,595	12,62,622	56·9
	1931–32	19,51,510	2,58,749	35,552	6,93,841	9,88,142	9,63,368	49·4
	Average	22,16,911	3,37,790	1,12,621	6,93,788	11,44,199	10,72,712	48·3
Central	1932–33	9,81,254	70,941	4,444	5,38,016	6,13,401	3,67,853	37·4
	1931–32	9,56,308	72,284	2,247	5,75,671	6,50,202	3,06,106	31·3
	Average	11,14,186	97,241	27,452	5,84,881	7,09,574	4,04,612	36·3
Southern	1932–33	23,31,205	9,11,373	25,027	5,50,032	14,86,437	8,44,768	36·2
	1931–32	23,39,930	11,69,722	16,912	6,12,257	17,98,891	5,41,039	23·1
	Average	27,80,179	11,05,217	47,867	6,23,501	17,76,585	10,03,594	36·0
Sind	1932–33	4,42,142	13,524	4,807	2,90,229	3,08,560	1,33,582	30·2
	1931–32	4,25,602	23,275	3,075	3,00,577	3,26,927	98,675	23·4
	Average	5,94,655	58,250	4,264	3,04,510	3,67,024	2,27,631	38·2
General Direction.	1932–33	14	1,24,646	..	67,829	1,92,475	—1,92,461	..
	1931–32	15	1,23,955	200	85,321	2,09,476	—2,09,461	..
	Average	19	82,602	88	85,334	1,68,114	—1,68,095	..
Forest Engineering.	1932–33	271	22,704	7	46,027	68,738	— 68,467	..
	1931–32	482	36,448	..	56,696	93,144	— 92,662	..
	Average	703	33,083	—6,517	47,675	74,241	—73,538	..
Total Presidency.	1932–33	59,71,103	13,75,760	1,10,390	21,37,050	36,23,206	23,47,897	39·3
	1931–32	56,73,847	16,84,433	57,986	23,24,363	40,66,782	16,07,065	28·3
	Average	67,06,053	17,14,273	1,85,775	23,39,689	42,39,737	24,66,916	36·7
Difference	1932–33 and 1931–32	+2,97,256	—3,08,667	+52,404	—1,87,313	—4,43,576	+7,40,832	..

N.B.—The above figures are exclusive of expenditure under BVIa—Work advances—as this expenditure is recoverable.

The financial results show considerable improvement. The surplus exceeded that of last year by Rs. 7,40,832 and was only less than the average of the previous quinquennium by Rs. 1,19,019. The increase in revenue is shared by the Northern, Central and Sind Circles, the revenue in the Southern Circle remaining almost the same as last year.

In the Northern Circle the demand for timber showed some improvement and a market was obtained for the accumulated stocks of timber at Waghai depôt in the Dangs. The timber coupes fetched good average prices especially in the Surat division. In the Central Circle better prices were obtained for coupes in the Poona, West Khandesh and Kolaba divisions and more royalty trees were disposed of in the Kolaba division. Grant of land for kharif cultivation in assured areas and for rabi cultivation in *kachas* due to a favourable abkalani and slightly better prices for coupes, etc., contributed to favourable results in the Sind Circle. In the Southern Circle the revenue remained practically stationary, chiefly due to trade depression. There was a further decline in sandalwood prices, and a lack of demand for minor produce such as *tarwad* and *kakai* bark.

Some anxiety was experienced regarding the disposal of the heavy stocks of junglewood timber at the Hattikeri depôt. However largely owing to the initiative of the Divisional Forest Officer, Southern Division Kanara, certain local contractors formed a syndicate and took over the entire stock. Only half the purchase money was recoverable during the year.

The surplus of the Circle as a whole rose by Rs. 3,03,729 as compared with that of the previous year owing mainly to economy and curtailment of expenditure in every direction.

There has been an appreciable decrease in expenditure under B-Conservancy, Maintenance and Regeneration, all Circles contributing thereto. The closure of the Haste sawmill in the West Nasik Division last year and the suspension of the working of the Sundha sawmill for a period of 4 months were mainly responsible for the decrease in the Northern Circle. Economy was effected by restricting expenditure to urgent items in the Central and Southern Circles. In the Sind Circle fewer departmental fellings were undertaken owing to unfavourable market conditions and with a view to economy smaller sums were spent on repairs to buildings and on silt clearance of *kasis*.

There was an increase in expenditure under 52-A Forest Capital Outlay principally in connection with road construction in the Dangs.

The decrease under C-Establishment was chiefly due to the savings effected by the emergency cut in pay. Leave and transfers were sanctioned only in urgent cases and as far as possible no substitutes were engaged during leave periods.

The sources of revenue are analysed and compared below :—

Sources and heads.	General Direction.	Forest Engineering	Northern Circle.	Central Circle.
REVENUE.	Rs.	Rs.	Rs.	Rs.
Ia and IIa—Timber ..	....	....	18,41,299	3,23,834
Ib and IIb—Firewood ..	....	....	26,243	89,391
Ic and IIc—Bamboos ..	....	....	64,993	15,164
Id—Sandalwood ..	....	....	....	4,201
IId—Grazing and grass ..	....	....	1,45,377	3,80,685
Ie and IIe—Other produce ..	....	....	31,364	35,994
III—Drift and confiscated forest produce.	....	....	449	2,205
IV—Forests not managed by Government.	....	....	1,598	23,795
V—Miscellaneous ..	14	271	1,13,149	1,13,894
Refunds ..	....	....	—8,255	—7,909
Total ..	14	271	22,16,217	9,81,254

Southern Circle.	Sind Circle.	Total		Increase or decrease.
		1932-33	1931-32	
Rs.	Rs.	Rs.	Rs.	Rs.
17,89,517	61,592	40,16,242	36,67,352	+ 3,48,890
1,62,515	2,29,137	5,07,286	5,04,988	+ 2,298
74,207	....	1,54,364	1,44,835	+ 9,529
1,02,632	....	1,06,833	1,33,120	—26,287
87,226	46,887	6,60,175	6,54,921	+ 5,254
31,145	19,786	1,18,289	1,49,296	—31,007
353	32	3,039	3,069	— 30
12	....	25,405	27,352	— 1,947
85,662	86,863	3,99,853	4,29,107	—29,254
—2,064	—2,155	—20,383	—40,193	+19,810
23,31,205	4,42,142	59,71,103	56,73,847	+2,97,256

The heads of expenditure are analysed and compared below :—

Sources and heads.	General Direction.	Forest Engineering.	Northern Circle.	Central Circle.
EXPENDITURE.				
B.—*Conservancy, Maintenance and Regeneration.*				
52-*A Capital Outlay on Forests.*				
I.—Timber, etc., extracted by Government Agency.	..	18,327	76,271	10,212
II.—Timber, etc., extracted by consumers or purchasers.	..	..	41,357	11,462
III.—Maintenance, Repairs and Renewals 52-A III, 52-A-IV and 52-A-V	20	3,421	1,01,757	15,773
IV.—Conservancy and Regeneration and 52-A-I and II.	..	..	47,472	15,035
V—Miscellaneous	59	963	41,821	22,903
Interest	1,24,567	..	....	....
Total	1,24,646	22,711	3,08,678	75,385
C.—ESTABLISHMENT.				
I.—Pay of officers	31,434	12,486	1,08,231	87,260
II.—Pay of Establishment ..	11,724	19,074	4,34,283	3,65,119
III.—Allowances	16,641	11,159	82,325	73,881
IV.—Contingencies	2,035	3,308	20,078	13,552
V.—Establishment charges payable to Central Government	6,380	..	....	....
Recoveries from Raisingpur ..	..	..	....	—1,796
Loss by Exchange	—385	..	....	....
Total	67,829	46,027	6,44,917	5,38,016
Grand total	1,92,475	68,738	9,53,595	6,13,401
Surplus, 1932–33 ..	—1,92,461	—68,467	+12,62,622	+3,67,853
Surplus, 1931–32 ..	—2,09,461	—92,662	+9,63,368	+3,06,106
Difference	+17,000	+24,195	+2,99,254	+61,747

Southern Circle.	Sind Circle.	Total		Increase or decrease.
		1932-33	1931-32	
7,63,824	2,350	8,70,984	11,64,230	—2,93,246
4,547	489	57,855	45,260	+12,595
1,07,260	4,554	2,32,785	2,05,405	+27,380
48,349	6,559	1,17,415	1,21,507	—4,092
12,425	4,379	82,550	82,209	+341
....	....	1,24,567	1,23,808	+759
9,36,405	18,331	14,86,156	17,42,419	—2,56,263
92,306	72,768	4,04,485	4,65,782	—61,297
3,74,131	1,55,833	13,60,164	14,47,639	—87,475
68,200	44,792	2,96,998	3,34,511	—37,513
15,395	16,836	71,204	70,449	+755
....	....	6,380	6,732	—352
....	....	—1,796	—1,531	—265
....	....	—385	+781	—1,166
5,50,032	2,90,229	21,37,050	23,24,363	—1,87,313
14,86,437	3,08,560	36,23,206	40,66,782	—4,43,576
+8,44,768	+1,33,582	+23,47,897	....	....
+5,41,039	+98,675	....	+16,07,065	....
+3,03,729	+34,907	....	....	+7,40,832

The revenue and expenditure are further analysed as follows :—

Class.	General Direction and Forest Engineering.		Northern Circle.		Central Circle.	
	Rs.	Per cent.	Rs.	Per cent.	Rs.	Per cent.
REVENUE.						
Major produce	..	..	18,67,543	84	4,17,426	42
Minor produce	..	..	2,41,734	11	4,31,842	44
Miscellaneous	285	100	1,15,195	5	1,39,894	14
Refunds	..	..	—8,255	..	—7,908	..
Total ..	285	..	22,16,217	..	9,81,254	..
EXPENDITURE.						
Conservancy, Maintenance and Regeneration and 52-A.						
Extension and constitution ..	..	..	86	..	250	..
Improvement	930	1	1,47,545	48	29,088	39
Exploitation	20,838	14	1,46,404	47	32,472	43
Miscellaneous	1,022	1	14,643	5	13,575	18
Interest	1,24,567	84	..	..	..	..
Total ..	1,47,357	..	3,08,678	..	75,385	..
ESTABLISHMENT.						
Administrative	57,794	51	40,580	6	41,388	8
Executive	46,027	40	1,71,610	27	1,45,357	27
Protective	10,035	9	4,32,727	67	3,51,271	65
Total ..	1,13,856	..	6,44,917	..	5,38,016	..

Class.	Southern Circle.		Sind Circle.		Total.	
	Rs.	Per cent.	Rs.	Per cent.	Rs.	Per cent.
REVENUE.						
Major produce	20,54,663	88	2,90,728	65	46,30,360	77
Minor produce	1,92,578	8	66,674	15	9,32,828	16
Miscellaneous	86,028	4	86,895	20	4,28,297	7
Refunds	—2,064	..	—2,155	..	—20,382	..
Total ..	23,31,205	..	4,42,142	..	59,71,103	..
EXPENDITURE.						
Conservancy, Maintenance and Regeneration and 52-A.						
Extension and constitution ..	..	..	..	..	336	..
Improvement	1,51,801	16	9,797	53	3,39,161	23
Exploitation	7,72,240	82	4,155	23	9,76,109	66
Miscellaneous	12,364	1	4,379	24	45,983	3
Interest	..	..	..	..	1,24,567	8
Total ..	9,36,405	..	18,331	..	14,86,156	..
ESTABLISHMENT.						
Administrative	43,462	8	48,289	16	2,31,513	30
Executive	1,63,583	30	1,15,229	40	6,41,806	11
Protective	3,42,987	62	1,26,711	44	12,63,731	59
Total ..	5,50,032	..	2,90,229	..	21,37,050	..

The expenditure incurred from the provision under 52-A Capital Outlay on Forests subsequently charged to Revenue is as shown below :—

Heads.	General Direction.	Forest Engineering.	Northern Circle.	Central Circle.	Southern Circle.	Sind Circle.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
I. Forest surveys ..	..	..	..	..	..	..	..
II. Organization improvement and extension ..	..	..	125	469	1,584	4,011	6,189
III. Communications and buildings ..	..	..	74,858	3,398	22,881	173	1,01,310
IV. Railways and tramways ..	..	..	..	..	..	..	..
V. Deadstock, stores, tools and plant ..	..	7	1,270	577	562	623	3,039
Deduct—Receipts and Recoveries on capital account ..	..	..	—148	..	..	..	—148
Total ..	..	7	76,105	4,444	25,027	4,807	1,10,390

The outstandings on account of revenue at the commencement and close of the year were :—

Circle.	On 1st April 1932.	On 31st March 1933.
	Rs.	Rs.
Northern	30,213	19,307
Central	9,778	3,189
Southern	2,46,448	2,49,546
Sind	94,695	1,58,463
Total ..	3,81,134	4,30,505

A sum of Rs. 1,305 was written off under proper authority in the Southern Circle.

The outstandings on account of contractors and disbursers were as follows :—

Circle.	On 1st April 1932.	On 31st March 1933.
	Rs.	Rs.
Northern	651	1,155
Central	104	20
Southern	31,192	30,388
Sind	186	363
Total ..	32,133	31,926

CHAPTER VI.

RESEARCH AND EXPERIMENTS.

Under the direct control of the Chief Conservator's office there were 11 subjects under investigation during the year ; one of these, No. 10, has been completed, having yielded useful information of local importance.

The work done and conclusions arrived at are briefly described in the notes which follow.

NATURAL REGENERATION.

Sandal (Santalum album).

After the research investigation in connection with subject No. 28—Effect of early burning on sandal growth and regeneration—had concluded, the two plots maintained in the Belgaum division, were subjected to a late fire on 30th March 1932, and it was made abundantly clear that such late fires are very destructive and must as far as possible be prevented in all sandal areas. Early burning tends to mitigate the severity of fires occurring late in the season, and a fire which breaks out in an area, which has been protected for a succession of years, causes more damage than in areas burnt off and on.

ARTIFICIAL REGENERATION.

Rosha grass (Cymbopogan martinii).

Subject No. 12.—*Artificial propagation of rosha grass (West Khandesh).*

Nursery experiments having shown that a high percentage of success was attainable by artificially propagating *rosha* grass, it was decided to put the results obtained to a practical test and orders were issued to plant up about 7 acres of land situated on a permanent fire line with tussocks of the grass. Last year and the year before, no work was done, but during 1932 an area, approximately 7 acres in extent was ploughed and planted at a cost of Rs. 117. A cessation of rain caused many casualities which, though replaced partly by fresh planting, were responsible for large gaps in the crop. The whole crop together with other growth was cut back and burnt and after the *rosha* threw out fresh shoots a thorough examination of the area disclosed that about 50 per cent. success had been secured. *Rosha* requires, it is locally believed, three years to establish itself. The plantation thus started will be kept under observation for 3 years and supplemented each succeeding monsoon with fresh tussocks. Figures of expenditure and of revenue from sale of the grass will be maintained.

Hirda (Terminalia chebula).

Subject No. 13.—*Propagation of hirda (Satara and Poona).*

Nurseries were ordered to be maintained in the Satara and Poona divisions with the object of experimenting in the artificial propagation of *hirda* by means of " stump " planting with seedlings of known age.

In the Poona division out of 1,200 plants raised in the nursery 605 were surviving at the end of December. These are being watered and are reported to be healthy. In the Satara division the nursery was laid out in the Mahableshwar range and out of 900 plants raised 239 were surviving on 15th February 1933.

Stump planting will be carried out during the ensuing rains and the results obtained will not be available till next year.

Khair (*Acacia catechu*).

With a view to collect confirmatory evidence of the possibility of artificially reproducing *khair* by means of root and shoot cuttings experiments were ordered to be undertaken in the scrub jungles of the North, East and West Khandesh divisions. Nurseries have been established in the above divisions and the seedlings raised therein will be utilised for stump planting in the rains of 1934.

Miscellaneous.

An experiment aiming at the eradication of prickly pear by means of the Cochineal insect was tried in the Dharwar and Badami ranges. Cactus leaves covered with the insects supplied by the Assistant Professor of Entomology, Poona, were tied to the leaves of prickly pear bushes, once in the summer and again in the rains. On both occasions the insects did not survive due, it is surmised, to adverse climatic conditions in the summer and heavy rains during the monsoon.

THINNINGS AND CLEANINGS.

Teak.

Subject No. 4.—*Effect of thinning teak coppice at different ages* (*East Thana*).

Remeasurements taken of the coppice in four of the eight plots under observation have at this stage yielded figures which show that the girth development in the thinned areas as a whole is greater than in the unthinned plots. The numbers on all trees in the unthinned plots were renewed and the boundary posts repainted, where necessary, while missing trees have been marked with a red circle on the tree charts and necessary entries made in the lists. It has been decided that height should be measured at intervals of 10 years instead of 2 years as originally intended.

Subject No. 5.—*Effect of different degrees of thinnings in teak plantations of different ages* (*West Nasik, West Thana and Belgaum*).

The second remeasurements of trees in the sample plots are to be recorded in 1934.

Subject No. 34.—*Effect of different degrees of thinning in teak plantations* (*Kanara Northern Division, Eastern Division, Southern Division and Western Division*).

Remeasurements are to take place at intervals of five years.

The Divisional Forest Officer, Working Plans, S. C., who is in charge of this investigation visited the plots in Northern Division, Eastern Division and Western Division Kanara and has recorded in the registers his remarks regarding the condition of the plots.

VOLUME TABLES.

Sandal.

Subject No. 7.—Annual girth increment of sandal (Belgaum and Dharwar-Bijapur).

The second remeasurements of the trees in the two plots in the Dharwar-Bijapur division were recorded in November 1932. No deductions at this stage are possible.

Subject No. 32.—To discover whether there exists any correlation between the outer girth increment and heartwood increment of sandal (Dharwar-Bijapur).

There is nothing to record this year.

Babul (Acacia arabica).

Subject No. 8.—Increment of babul under different degrees of thinning (Hyderabad, Sind).

During the year such computation work as was possible with the data recorded was accomplished. Advantage is being taken of the Imperial Silviculturist's offer to assist with all necessary computations. The records are being sent to Dehra Dun and all future work will be based on the instructions and advice of the Silviculturist.

Bahan (Populus euphratica).

Subject No. 10.—The economic age for cutting bahan (Shikarpur).

This experiment is now complete. From the careful analysis of the results prepared by the Divisional Forest Officer it is established that when allowance has been made for differences in soil, degree of inundation and variation of market rates and demand, the economic age for cutting *bahan* coppice in Upper Sind is approximately at six years.

Simul (Bombax malabaricum).

Subject No. 33.—The determination of the rate of increment of sawar (Panch Mahals).

Final measurements were taken in April 1933 after the close of the year.

MISCELLANEOUS SPECIES.

Subject No. 16.—Effect of improvement fellings on diameter growth (Surat, Dangs).

During the year the numbers and cross marks on the trees were renewed. Remeasurement is due in December next.

Experiments and Investigations carried out by Conservators and Divisional Forest Officers.

Measurements in the sample plots in Khandesh under the control of the Working Plans Officer, Central Circle, were taken soon after the close of the year and results will be available next year. A fresh series of plots in the Mahableshwar forests was laid out by the Working Plans Officer while collecting data for the revision of the Satara Working Plan.

Forest Botany.

Mr. R. W. Inder, F.L.S., Conservator of Forests, continued his work on the botanical survey of the Northern Circle with particular reference to ecological factors.

Silviculture and Allied Subjects.

Artificial propagation of sandal has been engaging attention for some time in the Belgaum division where it was confined at first to experiments in the Khanapur and Gujnal ranges. This year work was extended to the dry range of Gokak. Ploughing was found to be necessary in the case of direct sowings and in the case of transplants suitable overhead shade is required. Root and shoot pruned seedlings also yielded satisfactory results. The most suitable host plants appeared to be in order of merit *Cassia Siamea, Tamarindus indica, Acacia arabica* and *Azadirachta indica*.

In the Rahuja garden in upper Sind experiments were continued with *Gmelina arborea* and *Morus alba*.

Gmelina arborea.—The plants in stock made satisfactory progress and are healthy in appearance, the maximum height at 30 months being 13 feet. A fresh experiment was conducted with 125 seeds sown in specially prepared raised beds. Germination commenced on the 11th July, 10 days after sowing and continued up till the 22nd July the percentage being 12 per cent. The seedlings when about a foot high were transplanted 10 feet apart along trenches. The plants are thriving with a maximum height of 5 feet in 10 months.

Morus alba.—The results of the year have justified the following conclusions in regard to the objects with which the experiments were started last year:—

(1) *To discover the minimum water-supply necessary to keep the plants alive during the period April to October*.—The open plots with 3′–6″ delta both from seed and cuttings gave no results while those with a 14 feet delta were the best. It can be said with a fair degree of certainty that to secure good germination and growth in the initial stage of development a delta of 3′–6″ is *not* sufficient.

(2) *Whether "seedlings", "branch cuttings" or "root and shoot cuttings" give the best results*.—Root and shoot cuttings were not tried.

Branch cuttings.—The maximum height of shoots from cuttings in the open plot with a 14 feet delta was 8′-6″ in March 1933 and that of shoots in the plot under shade with 3′-6″ delta was 7 feet. The condition of cuttings in general was somewhat better than that of seedlings which did not look so vigorous or healthy.

(3) *Whether shade is essential for young plants.*—It was found that too heavy shade, as was provided and which is not likely to obtain under natural conditions, had an adverse effect in deflecting the shoots towards the light and producing lean and lanky stems.

(4) *Rate of growth under different methods of propagation.*—Cuttings produced the quickest growth, giving shoots 8′-6″ in height and 3″ girth as against seedlings the maximum height and girth of which were 5′ and 1″ to 3″ respectively.

The experiments with mulberry (*Morus alba*) in the Miani garden, Hyderabad division were continued with particular reference to the amount of water required. Three sections of trenches were dug in order to ensure correct measurement of the water supplied and it was noted that a weekly watering is necessary for plants raised from seed, a fortnightly watering merely keeping the plants alive without development. A delta of 4 feet in 52 waterings appears to be ample for raising mulberry from seed.

With regard to the plants raised last year, a few were attacked and killed off by some unknown disease in October-November 1932 and the remainder are doing well, seedling plants having reached a height of 9 feet and cuttings about 12 feet. The seedling plants when about a year old were thinned out to a distance of about 3 feet and resultant cuttings were supplied to the Public Works Department for planting in bungalow gardens in the Hala range.

Acacia cyanophylla and Jacaranda mimosæfolia.

The Conservator of Forests, Cyprus, supplied the seed of *Acacia cyanophylla* and *Jacaranda mimosæfolia* in exchange for seeds of Indian species sent to him. The former was tried in the Larkana, Hyderabad and Karachi divisions and the results obtained were disappointing. The seed of *Jacaranda mimosæfolia* was tried in Dharwar but did not germinate. The Personal Assistant to the Chief Conservator was successful in raising a few plants of this species in his garden in Poona, and the Empress Gardens, Poona, to which some seeds were supplied, report that very good results were secured.

An experimental test nursery was started in the Bahaman forest, Larkana division, under the direct control of the Divisional Forest Officer, Working Plans, in order to discover what timber species can successfully be grown on canal water in Sind. During the year experiments with *tali*, mulberry and *shivan* only were carried out and the results are promising.

The Divisional Forest Officer, Hyderabad (Mr. Dalley), carried out an investigation with a view to arriving at a workable formula for calculating the yield of standing *babul* crops.

Experimental and Commercial Activities.

Seventy-one tons of first quality teak timber were purchased by the Portuguese authorities at Goa for export to Lisbon.

Experimental propagation of lac.

In the Dharwar range of the Dharwar-Bijapur division the experiment in the propagation of lac was continued during the year with promising results.

In the North Khandesh and Panch Mahals divisions the experiment was abandoned on account of continuous failure.

CHAPTER VII.

ADMINISTRATION.

The office of the Chief Conservator of Forests was held throughout the year by the writer of this report.

The territorial Circles were held by the following officers :—

Northern Circle	.. Mr. R. W. Inder—throughout the year.
Central Circle	.. Mr. A. C. Hiley—from 1st April to 16th September 1932.
	Mr. H. W. Starte—from 17th September 1932 to 31st March 1933.
Southern Circle	.. Mr. D. B. Sothers—throughout the year.
Sind Circle	.. Mr. C. E. L. Gilbert—throughout the year.
Forest Engineering Branch.	.. Mr. R. V. Alexander—throughout the year.

Divisional charges were held by officers named below :—

Division.	Name of officer.	From	To
Panch Mahals ..	Mr. S. P. Pandya ..	Throughout the year.	
Surat ..	Mr. E. O. Sampson.	Throughout the year.	
North Thana ..	Mr. W. de C. Walsh.	1st April 1932 ..	26th October 1932.
	Mr. R. J. Smith ..	27th October 1932 ..	31st March 1933.
East Thana ..	Mr. R. F. Sandeman.	Throughout the year.	
West Thana ..	Mr. V.A.N. Sausman.	1st April 1932.	
	Mr. G. S. Singh ..	2nd April 1932 ..	31st March 1933.
East Nasik ..	Mr. R. K. Kanitkar.	1st April 1932 ..	4th April 1932.
	Mr. H. P. W. Davis.	5th April 1932 ..	23rd August 1932.
	Mr. V.A.N. Sausman.	24th August 1932 ..	31st March 1933.
West Nasik ..	Mr. H. P. W. Davis..	Throughout the year.	
Working Plans, Northern Circle.	Mr. H. J. C. Millett..	22nd March 1933 ..	31st March 1933.
Gurcharan Officer, Thana.	Mr. F. X. Saldanha..	Throughout the year.	
East Khandesh ..	Mr. J. Petty ..	Throughout the year.	
North Khandesh.	Mr. Abdul Rahim ..	1st April 1932 ..	26th October 1932.
	Mr. W. de C. Walsh.	26th October 1932 ..	31st March 1933.

Division.	Name of officer.	From	To
West Khandesh..	Mr. H. C. Holmes ..	Throughout the year.	
Poona ..	Mr. R. A. Shirali ..	Throughout the year.	
Kolaba ..	E. T. C. Vas ..	Throughout the year.	
Satara ..	Mr. J. A. Singh ..	1st April 1932 ..	14th October 1932.
	Mr. V. N. Hasabnis..	15th October 1932 ..	31st March 1933.
Working Plans, Central Circle.	Mr. E. A. Garland ..	1st April 1932 ..	16th October 1932.
	Mr. J. A. Singh ..	17th October 1932 ..	31st March 1933.
Kanara, N. D. ..	Mr. S.N.J. Ratnagar.	Throughout the year.	
Kanara, E. D. ..	Mr. J. Walker ..	1st April 1932 ..	8th April 1932.
	Mr. D. V. Phatak ..	9th April 1932 ..	4th November 1932.
	Mr. J. Walker ..	5th November 1932.	31st March 1933.
Kanara, S. D. ..	Mr. F. A. B. Coelho.	Throughout the year.	
Kanara, W. D. ..	Mr. Y. R. Divekar ..	Throughout the year.	
Belgaum ..	Mr. K. V. Mankikar.	1st April 1932 ..	13th November 1932.
	Mr. J. B. T. Brooks.	14th November 1932.	31st March 1933.
Dharwar-Bijapur.	Mr. H. W. Starte ..	1st April 1932 ..	14th September 1932.
	Mr. S. N. Kesarcodi.	15th September 1932.	15th November 1932.
	Mr. V. S. Kanetkar..	16th November 1932.	23rd December 1932.
	Mr. S. N. Kesarcodi.	24th December 1932.	31st March 1933.
Working Plans, Southern Circle.	Mr. S. N. Kesarcodi.	1st April 1932 ..	19th October 1932.
	Mr. E. A. Garland ..	20th October 1932 ..	14th March 1933.
	Mr. D. B. Sothers ..	15th March 1933 ..	31st March 1933.
Sukkur ..	Mr. N. C. Ramchandani.	Throughout the year.	
Shikarpur ..	Mr. N. C. Ramchandani.	1st April 1932 ..	15th September 1932.
	Mr. M. L. Khanna ..	16th September 1932.	31st March 1933.
Larkana ..	Mr. M. L. Khanna ..	1st April 1932 ..	27th June 1932.
	Mr. G. J. Ramchandani.	28th June 1932 ..	2nd November 1932.
	Mr. Abdul Rahim ..	3rd November 1932.	31st March 1933.
Hyderabad ..	Mr. R. P. Dalley ..	1st April 1932 ..	27th January 1933.
	Mr. G. J. Ramchandani.	28th January 1933 ..	12th February 1933.
	Mr. R. P. Dalley ..	13th February 1933..	31st March 1933.
Karachi ..	Mr. E. S. B. Tavener.	Throughout the year	
Working Plans, Sind Circle.	Mr. C. G. Abichandani.	Throughout the year.	

There were as usual some changes among Divisional Forest Officers chiefly owing to absence of officers on leave. The Working Plans Division in the Northern Circle, which was held in abeyance from 2nd November 1931, was temporarily restored from 22nd March 1933, the corresponding division in the Southern Circle being kept vacant.

The number of officers attached to divisions as Assistants to Divisional Forest Officers or Sub-Divisional Forest Officers at the close of the year was 10, of whom 2 were Class I and 8 Class II officers.

A new direct recruit, Mr. A. D. Mufti, was appointed to Class I of the Bombay Forest Service on probation for 3 years and he was attached to Kanara E. D. from 21st March 1933.

Messrs. K. V. Mankikar and G. M. Nerlekar, officers of Class II of the Bombay Forest Service, retired from service from 20th December and 8th May 1932 respectively.

The Reorganization Committee recommended the abolition of one of the Kanara divisions and a redistribution of the forests comprised in the Shikarpur, Larkana and Sukkur divisions with a view to reduce the number of divisions from three to two. Government, after careful consideration, sanctioned the amalgamation of the Kanara Western division with Kanara Southern division and Kanara Northern division and the change took effect from 1st July 1933. As regards the redistribution of the three divisions in Sind, Government decided against the proposal and no change has been made.

Subordinate and Clerical Establishments.

Six ranger students completed their training at the Madras Forest College, Coimbatore. Of these 5 passed with Higher Standard certificates and 1 with a Lower Standard certificate. Three new ranger recruits were selected for the course of 1933–35 of whom, one resigned at the end of his period of practical training.

The Forest Class at Mandvi in Thana district of the Northern Circle was restarted under the supervision of a Range Forest Officer. The class was held for a continuous term of 6 months from 18th October 1932 to 15th April 1933. In all 26 subordinates joined the class—10 from the Northern Circle, 12 from the Central Circle and 4 from Indian States. Of these, 22 passed successfully, one of them with credit. Two students were sent back as they were unable to follow the course and 2 could not continue the course owing to illness. In the Southern Circle 13 junior foresters and guards were selected for a special course of training under selected rangers. Of these, 11 passed out successfully and 2 failed to pass the final examination.

Casualties and Punishments.

Particulars.	General direction.	Northern Circle.	Central Circle.	Southern Circle.	Sind Circle.	Total. 1932–33.	Total. 1931–32.
1. Retirements ..	..	24	29	25	3	81	91
2. Deaths ..	..	11	6	13	5	35	37
3. Resignations ..	..	12	4	..	6	22	22
4. Degradations ..	..	14	11	8	12	45	42
5. Prosecutions ..	..	1	..	..	1	2	..
6. Dismissals, Removals, etc. ..	..	8	8	1	8	25	42
Total ..	..	70	58	47	35	210	234

The health of the forest staff was on the whole fairly good except in the Dangs (Surat), North Thana, East Thana, West Nasik and in Kanara where as usual malaria caused a lot of sickness and dislocation of work.

The case of theft of Rs. 32–12–0 (including Rs. 15–12–0 of Government money) which occurred in the house of the Round Officer, Shenit, remained

undetected. The Government money has been recovered from the Round Officer.

One Dattatraya Bala Sali who impersonated a forest guard and checked carts of forest produce coming into Poona city, harassing the cartmen for his own benefit was prosecuted and sentenced to 6 months' rigorous imprisonment.

The work of the rangers and other subordinate protective and office establishments is reported, with few exceptions, to be satisfactory.

Inspection and Tours.

The Chief Conservator toured in all four Circles of the Presidency. The Divisional and other offices were inspected by Conservators as usual. No serious irregularities were brought to notice.

Civil Suits.

In all 4 fresh civil suits (one in the Northern Circle, one in the Central Circle and two in the Southern Circle) were instituted against the Department by forest contractors, of which one was decided against, and one in favour of Government and two (one in the Northern Circle and one in the Central Circle) are pending. Legal assistance was given by the Department to a forest contractor of Roha in the Central Circle in a suit filed against him by a private individual as Government interests were involved. The suit was dismissed with costs, but the plaintiff is said to have preferred an appeal. Three suits against the Department were pending from the previous year. Of these, one of E. D. Kanara was decided in favour of Government, one of Shikarpur division was compromised and one which was filed by the Khot of Gopalwat and his co-sharers is still pending. Out of the 9 appeals (one filed by the Khot of Tise in the Central Circle, four by contractors and four by Government), 3 were decided partly in favour of Government, 2 against Government, 1 was compromised and 3 are pending.

Land Revenue Administration.

The Divisional Forest Officer, West Nasik, continued to be in charge of the land revenue and excise administration of Peint taluka. The Divisional Forest Officer, Surat, continued to be *ex-officio* Assistant Political Agent, Dangs.

The Excise and Revenue Administration of the Akrani Mahal continued to be managed by the Forest Department.

The Raisingpur Estate was as usual managed by the Forest Department under the Court of Wards.

The Revenue administration of Pal and a few other villages in the East Khandesh district was continued by the Forest Department.

The three Forest Mahals of Dandeli, Kulgi and Virnoli in the Kanara N. D. continued to be under the administration of the Forest Department. Of the two Forest Mahals Bilki and Kirwatti in Kanara E. D., the former was abolished while the latter remained under the administration of the Divisional Forest Officer, Kanara E. D. as *ex-officio* Assistant Collector,

Kumries.

The villagers of Gavali in Belgaum division complained that their *Hangami Kumri*, parts 4 to 8 are uncultivable as the soil is rocky and exposed to the full force of the monsoon wind and rain, and asked for an exchange of land from jungle number 70. A similar complaint was received from the villagers of Chikhale. Both these complaints were investigated by the Divisional Forest Officer, who has reported with recommendations, but as the requests were received too late in the year for effective action during the monsoon of 1933, the question will be finally settled during the fair season in November 1933.

Most of the *Kumri* villages were inspected by the Divisional Forest Officer during the year.

Village panchayats.

There was no change in the number of *panchayats* during the year. No new *panchayats* were formed.

In Kanara Northern Division, the following work was done by the seven village *panchayats* :—

	Acres.
Area cleared during the year	1
Area cleared up to date	87

The area still remaining to be cleared is nil. The revenue collected by the *panchayats* in 1932–33 was Rs. 4–2–0. The areas in Ajminhal, Hosur, Nilwani and Tattigeri have been recleared but in the remaining three villages, the people have not done re-clearing and have not therefore availed themselves of the concessions granted to them.

In the Kanara Southern Division the Divisional Forest Officer reports that the village *panchayats* in that division have practically ceased to function although the forests are still well conserved. No works of improvement or reproduction were undertaken except the clearing of an area of 27 acres of thorny bushes in Shetgeri village.

From the Collector of Kanara's remarks on the Administration Report of the Kanara Southern Division it appears that the *panchayat* at Kamage, Hegre and Agragone has cleared the whole area (479 acres 16 gunthas) of thorns by cutting and burning in order to improve the grazing.

CHAPTER VIII.

GENERAL REMARKS.

His Excellency the Governor of Bombay and Lady Sykes paid a visit to the Southern Circle during the last week of December 1932. The camp was fixed at Dandeli in Kanara Northern Division. The Dandeli mill and depôt were inspected and visits were arranged to the teak plantations established during the past 12 years in Northern, Eastern

and Western divisions of Kanara. In addition the methods of timber extraction were studied, both by elephant work in Kanara Eastern Division and by Fordson winch hauling in Gund in Kanara Western Division.

Trade depression continued, but on the whole, conditions showed a distinct improvement over those of the past year. Compared with other important commodities, timber and particularly teak, has held its own well. Business has not been brisk, but on the other hand there has been no stagnation and no large stocks have accumulated. The large accumulations of timber at the Waghai depôt in the Surat division and at the Hattikeri depôt in Kanara S. D. were cleared during the year.

The West Nasik division which at one time was worked at a loss recorded a surplus of Rs. 55,415 as against Rs. 13,581 in the previous year. It should however be noted that the surplus is largely due to the sale of sawn timber carried over from previous years. With the opening of the Peint forests, where extension of roads as laid down in the working plan must be pushed on as rapidly as possible, revenue will expand and the division will ultimately show a substantial surplus.

Economies.—In pursuance of the policy of reducing establishment wherever possible, two vacancies in the IV grade of rangers and 1 post of a temporary depôt officer were retrenched in the Northern Circle.

Civil Disobedience Movement.—This movement is practically dead almost everywhere but in Kanara Southern division attempts were made by congress agitators to intimidate local buyers of timber in the Hattikeri depôt, by threats of setting fire to their dwellings and to the timber purchased by them. The District Superintendent of Police, Kanara, however attended a conference convened by the Divisional Forest Officer, of all contractors who were assured of every protection against possible attacks by agitators. With this assurance the leading local contractors agreed to form a Syndicate, and to take over the whole stock of *matti* timber remaining in the depôt.

In Belgaum division, one case occurred in Gujnal range, in which 98 sandalwood saplings and 2 junglewood trees were cut by 3 villagers of Pachapur, one of whom is at large, and the two others were apprehended and prosecuted. The prosecution ended in conviction of the accused, each being sentenced to 2 years' rigorous imprisonment and a fine of Rs. 1,000. Rs. 50 were ordered to be paid to the Forest Department as compensation.

Thana Gurcharans.—The Gurcharan officer completed collection of data for a working plan for the Thana Gurcharans and submitted a preliminary report. He has also completed the forest settlement work in 55 out of 58 villages, where portions of Gurcharans are proposed to be converted into reserved forest. He continued the educational work of explaining to the villagers the privileges allowed to them in reserved forest and in gurcharans and gave *tahal* demonstrations. In villages where the agriculturists expressed their willingness to co-operate in regard to the conservancy of Gurcharans, *panchas* from amongst the

agriculturists were selected to regulate the lopping of *tahal* and to report offences. The support of villagers was also enlisted in several places in connection with conservancy and closure to grazing and with *tahal* lopping in coupes to be worked under the plan.

Khairan-patti forests.—The area to be handed over to the Revenue Department in accordance with G. R., R. D., No. 43/28, dated 24th July 1931 was cleared of valuable tree growth in 6 out of the 7 *guts* sold last year. The unworked *gut* could not be sold for want of a purchaser. The transfer of the area will shortly be effected.

Forest Advisory Committees.—In the Northern Circle, 4 meetings were held, 2 in the Panch Mahals and 2 in Nasik. No business was transacted at the meetings held in the Panch Mahals as there were no subjects for discussion. The questions discussed at the meetings in Nasik related to the East Nasik division, the subject dealt with being the restriction of sheep and goat grazing, closure of felled areas for a period of 10 years to cutting of *anjan* leaves, closure of coupes to grazing, removal of fuel headloads for sale, extension of game rules, etc. The questions as regards closure of coupes and grazing of sheep and goats are being dealt with in the Revised Working Plan which is under preparation and the question of revision of hunting and shooting rules is under consideration.

In the Central Circle 6 meetings were held, 2 in West Khandesh, 2 in East Khandesh and 2 in Kolaba. No important subjects were discussed. At the request of some members of the East Khandesh Committee additional boundary cairns are being erected by forest guards where existing cairns are a long distance apart. In view of the very few subjects brought up for discussion and in order to avoid waste of time of officials and to economise expenditure on travelling allowance of non-official members, the Conservator of Forests, Central Circle, is of opinion that only one yearly meeting (instead of 2 as at present) should be held in the monsoon when all official members are at headquarters.

In the Southern Circle four meetings of the Committee were held, 2 in Kanara and 2 in Dharwar. As usual the matters brought forward by the unofficial members in Kanara were of no particular importance. In Dharwar, several small points of local interest were discussed at the first meeting and at the second meeting no subjects were discussed there being none on the agenda.

Forest cultivation and Forest settlements.—The revenue realized on account of assessment on forest lands given out for cultivation in the Northern Circle amounted to Rs. 23,392. In the East Khandesh division one new settlement was opened at Charthana to provide land to the families of the men killed and injured in the forest fire near Charthana. Each family has been given 10 acres of land for cultivation. No new settlements were opened in the North and West Khandesh divisions but an area of about 1,000 acres in the former division and 90 acres in the latter division have been demarcated with a view to increasing the holdings. Settlers' crops were fairly good. Assessment was recovered in full in all cases.

Cattle Breeding Farms and Societies.—An area of 500 acres from the Fuel Felling Series in the Taloda range, North Khandesh division was granted to Dr. V. H. Patil by Government for a model farm for cattle breeding, dairying, etc. The land has been demarcated and will be cleared shortly. The cattle breeding society at Pimple in the East Khandesh division is doing well. The position of the one at Gangapuri is less satisfactory. It is short of funds and in the past the management has been inefficient.

Alnavar-Dandeli Railway.—The revenue and expenditure of this Railway for the two years 1932–33 and 1931–32 compare as follows :—

Year.	Receipts.	Expenditure.	Surplus or deficit.
	Rs.	Rs.	Rs.
1932-33	47,401	40,412	+6,989
1931-32	40,848	44,489	—3,641

The working shows a net profit of Rs. 6,989 as against a loss of Rs. 3,641 in the previous year. This satisfactory result is due partly to the increase in goods traffic as the result of larger export of bamboos and timber and partly to the reduction in the maintenance charges on structural works. As pointed out in last year's report the small surplus as shown above does not adequately represent the value of this railway to the Department. It is instrumental in reducing considerably all transport costs to the main line and in opening up additional sources of revenue.

Grass storage under the nine year monopoly contract.—Owing to poor demand the purchaser of the grass at Godhra could not complete payment and removal within the contract period. He has been granted extension till 31st March 1934. He only paid for and removed 33 lakhs lbs. during the year. The damaged fodder amounting to 7,92,140 lbs. was sold for Rs. 1,186.

The purchaser of the grass at Dohad also applied for extension but did not accept the terms under which it was offered. Of 58,99,240 lbs. of grass sold to him he paid Rs. 2,955-10-0 for 7,30,000 lbs. and removed 7,23,335 lbs. leaving a balance of 51,75,905 lbs. on 31st March 1933. This grass is being resold at the purchaser's risk. Attempts are also being made to dispose of the stock of unsold grass amounting to 38,35,850 lbs. One sample wagon containing 16,340 lbs. was sold at Rs. 3 per 1,000 lbs. The quantities on hand at the close of the year were :—

	Lbs.
Godhra depôt	44,97,360
Dohad depôt	89,95,415

Match Factories.—The Gujarath Islam Match Manufacturing Company removed only 92 cartloads of matchwood at the concession rate of 6 annas per cartload from the Panch Mahals forests and none

from the Dangs forests. Matchwood from specified species in the North Dangs was sold for a fixed sum of Rs. 231-4-0. In the Central Dangs 528 cartloads of wood were removed on payment of Rs. 825. There was no demand for the matchwood coupe in the West Thana division. The Matchwood coupe in North Thana was sold for Rs. 3,100.

Agricultural Show.—An agricultural show was held at Betegaon in the Thana district. A certificate and silver medal were awarded to the Forest Department for the samples of forest exhibits. The samples were, on the conclusion of the exhibition, presented to the High School at Bordi for the school museum.

Hunting and Shooting.—The revenue received from shooting license fees was Rs. 8,555. The following statement shows the animals reported to have been killed by license holders in Government forests :—

Animals.	Northern Circle.	Central Circle.	Southern Circle.	Total.
Tiger	8	17	18	43
Panther	18	16	33	67
Bison	..	..	29	29
Sambhar	..	3	6	9
Cheetal	1	..	8	9
Wild dogs	..	2	4	6
Wild elephant	..	..	14	14
Bear	..	3	9	12
Wild pig	1	..	5	6
Barking deer	..	2	1	3
Nilgai	1	7	..	8
Wild cat	1	..	..	1
Hyæna	..	1	..	1
Blue bull	..	1	..	1
Total ..	30	52	127	209

In addition to the above special permission was granted to Mr. P. N. Bhide, M.Ag., Assistant Director of Agriculture and three shikaris accompanying him to hunt and shoot wild pig in certain reserved forests of the Poona division and 59 pigs were accounted for.

Hunting and shooting in the Dangs, has been conceded as a privilege to the local villagers and no record is available of the number of animals shot.

Shooting of *chital* in Mandvi (Surat division) where the species is becoming scarce has been prohibited by the Conservator.

Rewards paid by the Revenue Department in the Southern Circle for destroying noxious animals amounted to Rs. 563. The kind of animals and the sums paid are as shown below :—

	Rs.
Wild elephant	450
Wild dogs	55
Wild pig	58
Total ..	563

Five men were killed by tigers and panthers in the Dangs (Surat Division). In East Khandesh bears attacked and seriously wounded 3 men, but all survived. In Shirpur East range, North Khandesh Division one man, who was insufficiently armed, was mauled by a wounded panther. He has since recovered.

Shooting licenses are issued free of charge in the Sind Circle as there is little game in the forests other than hog deer and wild pig. The majority of persons to whom shooting licenses are granted agree to render assistance to the Forest Department and in fact do so. There is however considerable likelihood of hog deer being exterminated by illicit shikaris, especially during the inundation season when floods drive the deer out of the riverain forests and force them on to isolated islands above flood level or into the thinly wooded areas inland. There they are at the mercy of bands of men who hunt them with dogs. The shikar rules require to be recast and this matter is under consideration.

The 10,000 acre irrigated plantation scheme in Sind, referred to in last year's report, is still under consideration by Government who have decided that all work and expenditure in connection with the scheme should be held in abeyance until a decision is reached. The question of the supply of surplus water from the Barrage Canals to the inland forests, outside the 10,000 acres selected for irrigated plantations is still under consideration. The present Chief Engineer in Sind has resiled from the opinion given previously by his predecessor that ample supplies of surplus water will be available from Barrage Canals for irrigation of inland forests. It is now stated that no water will be available. The question has therefore had to be reopened and a decision reached as to which opinion is correct and what policy should be followed.

Remarks of Divisional Commissioners on Circle Reports are printed below :—

Commissioner, Northern Division (Mr. J. H. Garrett, C.S.I., I.C.S.) :

" Final notification under section 20 of the Indian Forest Act, 1927, constituting the lands in the village Ambapore in the Mandvi Taluka, referred to by the Conservator has now been published.

" 2. The total number of forest offences increased from 7,446 to 7,648 in the year under report. There is an increase of 277 offences under the head ' Other Offences ' but this has been partly counterbalanced by a decrease of 75 offences under the heads ' Fires ', ' Unauthorised Felling ' and ' Unauthorised Grazing ' leaving a net increase of 202 offences on the whole. This increase is attributed to stricter application of the transit rules. It occurred in all the Divisions of the Northern Circle except those of the Panch Mahals and Surat.

" In the Panch Mahals District there is a fall in offences under ' Unauthorised fellings ' and ' Unauthorized grazing '. This fall is reported to be due to levy of heavy compensation. The fall under ' unauthorised fellings ' was also due to the fact that the recent grant of the privilege of taking dead wood by the Bhils and Naikadas for sale has been made lawful what was hitherto regarded as penal.

" 134 new cases were taken to court. 156 cases (inclusive of 58 cases pending at the end of the last year) were decided of which 142 (91 per cent.) ended in conviction. 6,345 cases were compounded and an amount of Rs. 33,301 was realised as compensation. In 153 cases the offenders were let off with a warning while in 1,353 cases they could not be detected.

" The number of offences under the head ' Fires ' in the whole Circle decreased from 665 to 635 (i.e. by 30). The Panch Mahals Division however shows an increase of 34 offences as compared with the previous year. The increase in this District is attributed to accidental fires on the roads and railway lines passing through forest area as also to intentional fires caused by cattle thieves and long term contractors of grass and timbru leaves. In the case of the Surat District a meeting of all Patels and prominent forest villagers of Mandvi Taluka was convened by the Sub-Divisional Forest Officer, Mandvi, to impress upon them the advantages derived from forests and the importance of keeping them immune from fire. This had a good effect and the villagers came out promptly to extinguish the few fires that occurred. Fire protection in the Dangs continued to be a success. Turbans and silver bangles of an aggregate value of Rs. 690–4–0 were purchased and distributed as rewards among deserving Patels and village servants in the Dangs. In the Thana District grazing privilege at Suryamal was suspended for 1 year by way of communal punishment. This had a good effect in keeping the record of offences at a low ebb. In view of the change in the attitude of these villagers the grazing privilege has since been restored.

" 3. The grazing fees amounted to Rs. 97,743 as against Rs. 80,194 in the preceding year, the increase being attributed to the greater number of cattle admitted to grazing.

The number of cattle impounded for unauthorised grazing was 39,148 as against 37,178 in the year previous. The increase is reported to have been shared to a large extent by North and East Thana and West Nasik. The increase is attributed to vigilance exercised by the subordinates of the Department.

" 4. The total revenue from the working of the forests increased from Rs. 19,51,510 to 22,16,217 while the expenditure fell from Rs. 9,89,203 to 9,52,675. The Conservator in connection with the increase in revenue remarks that though the financial results are favourable, the revenue is much below the normal and it will continue to be so as long as there is a trade depression. With regard to the above remarks of the Conservator it may be observed that the average revenue of the previous quinquennium was Rs. 22,16,911 and the income during the year under report is Rs. 22,16,217. From this it will be seen that there is not much difference* in revenue but the normal increase which could otherwise be expected is not realised. The increase in revenue during the year under report is chiefly attributed to good prices fetched

*Note.—The average revenue of the previous quinquennium is much below normal owing to political boycott during the period (Chief Conservator).

by timber coupes and better demand of bamboos in the Surat Division and to increased revenue from grass and grazing due to vigilance exercised in collecting grazing fees in the East Nasik Division.

" 5. The expenditure on 'Communications and Buildings' under '52A Capital Outlay' increased from 33,930 to 74,858. This increase is chiefly due to receipt of larger grant under the head during the year under report than in the preceding year.

" The decrease in expenditure from Rs. 2,59,810 to Rs. 2,31,653 under 'B-Conservancy and Works' is attributed to the closure of the Haste Saw Mill and the suspension of the working of the Sundha Saw Mill for 4 months during the year.

" 6. *General Remarks.*—(*i*) The Gurcharan Officer, Thana, completed the forest settlement work in 55 out of 58 villages where portions of Gurcharans were proposed to be converted into reserved forest.

" (*ii*) The transfer of the forest area from Khairan Patti to the Revenue Department in accordance with Government Resolution, Revenue Department, No. 43/28, dated 24th July 1930, will shortly be effected after the growth of trees therein is fully cleared.

" (*iii*) The Forest Advisory Committees have not done any useful work in the Northern Division.

" (*iv*) The sale of teak trees in Malki Varkas lands, the suspension of which was ordered in Government Memorandum No. 2574-D/24 dated 25th September 1930, was ordered to be resumed in Government Memorandum No. 2574-D/24, dated 22nd September 1932.

" (*v*) The year under report was on the whole more prosperous than the preceding one and the relations between the Forest and other Government Departments continued to be cordial."

Commissioner, Central Division (Mr. W. W. Smart, I.C.S.) :

* * *

RIGHTS AND PRIVILEGES AND FREE GRANT.

" 3. In his Administration Report for 1931-32 the Conservator of Forests, N. C., had remarked that there had been a tendency on the part of some Collectors to recommend free grants to people who are not really poor as a reward for loyal services. It now appears that these remarks pertained only to the Surat District which is not in this division.

" It is satisfactory to note that during the year under review free grants of timber were made in the Central Circle to poor people in deserving cases for the construction of and repairs to houses and huts and also for the construction of works of public utility.

FOREST OFFENCES.

" 4. The total number of offences was 8,599 as against 8,798 in the previous year. The decrease of 199 was shared by all the districts except West Khandesh, East Nasik and West Nasik.

"(*a*) *Injury by fire.*—There is a decrease of 26 offences under this head in the division as a whole. There was a slight rise in the number of offences in the Khandesh and Nasik Divisions but this was counterbalanced by a corresponding decrease in the Satara and Poona Divisions.

"(*b*) *Unauthorised felling.*—There was a total decrease of 300 offences under this head. The large decrease of 310 in the Satara Division counterbalanced the increase in the East Khandesh, West Khandesh and East Nasik Divisions and was due partly to the strenuous efforts of the Forest subordinates and partly to the free grants of timber which were made promptly in deserving cases.

"(*c*) *Unauthorised grazing.*—There is a slight increase of 8 in the total number of offences under this head. The abnormal increase of 63 in the East Nasik Division is attributed to vigilance on the part of the forest subordinates but this cannot be proved in the absence of detailed information.

"(*d*) *Prosecutions.*—Out of the total number of 143 cases in the Central Circle 105 were disposed of, convictions being obtained in 90 cases. Apart from this 6,819 cases were compounded and brought in compensation amounting to Rs. 43,948.

PROTECTION FROM FIRE.

"5. The total area burnt in this Division during the fire season ending 31st May 1933 was 350 square miles as compared with 335 square miles in the previous year. The North Khandesh Division shows an increase of 60 square miles and is chiefly responsible for the aggregate increase. There were also small increases in the West Khandesh, Satara and West Nasik Divisions which are counterbalanced by corresponding decreases in the East Khandesh, Poona and East Nasik Divisions. The increase in the North Khandesh Division is reported to be due to 3 very big fires in Akrani which account for nearly half the total area burnt in that Division during the year.

"The increase in the West Khandesh Division is said to be due to the indifference of the people in the bordering villages of Pimpalner and Chinchpada Ranges. The Collector has recently submitted a proposal asking for my approval under Government Resolution, Revenue Department, No. 8654/24 dated 29th July 1932, to the infliction of communal punishment in the case of six villages coming under these two Ranges and the matter is receiving my consideration.

"The improvement in the attitude of the people in Satara district may be attributed to the Loyalty Leagues which with encouragement of the Collector have carried on continuous and extensive propaganda in this district.

GRAZING FEES.

"6. The West Khandesh Division was chiefly responsible for the decrease in the revenue realised from grazing fees in the Central Circle. This decrease is partly counterbalanced by a corresponding increase in

the North Khandesh Division where the professional graziers brought 10,000 more cattle to graze this year.

" The grazing receipts in East Khandesh Division rose from Rs. 51,279 to Rs. 68,395 and the increase is attributed to the greater vigilance exercised by the Forest Subordinates in recovering these dues.

" 7. *General*—It is gratifying to note that there was an increase in the gross forest revenue both in the Central Circle as well as in the Northern Circle. The increase in the Central Circle was chiefly due to obtaining better prices for coupes in the Poona, West Khandesh and Kolaba Divisions

" The Civil Disobedience movement was moribund in this Division during the whole year and relations between the public and the Forest Department appear to have improved. The remarks of the Collector of Satara as to bringing to the notice of villagers the contents of the pamphlets ' The need for Forest laws ' and ' Why we want them ' are being brought to the notice of other Collectors in this Division.

" I refrain from making any remarks on the work of individual Forest Officers as I have not yet had time to acquaint myself personally with their activities. The increase in the gross forest revenue and the decrease in the total number of forest offences, however, indicate a very successful year's working in this division as a whole."

Commissioner, Southern Division (Mr. A. W. W. Mackie, C.I.E., I.C.S.) :

Southern Circle.—The gross revenue of the year was Rs. 23,31,205 and the expenditure was Rs. 14,86,437 as against Rs. 23,39,930 and Rs. 17,98,891 respectively during the previous year. A slight fall (Rs. 8,725) in revenue was thus more than counterbalanced by a large decrease (Rs. 3,12,454) in expenditure resulting in an increase of over three lakhs in the surplus as compared with the surplus of the previous year. The gross revenue increased in Kanara, N. D., E. D., and Belgaum Divisions due to the supply of extra sleepers and sawn timber to the Madras and Southern Maratha Railway, larger earnings of the Alnawar-Dandeli Railway, sale of rejected material and better prices received for timber and coupes. The decrease of revenue in Kanara Southern Division and Dharwar-Bijapur Division is ascribed to non-recovery of part of the revenue of 1932-33 and to inadequate prices obtained for sandalwood on account of the general trade depression. The revenue of Kanara W. D. fell from Rs. 2,17,310 in 1931-32 to Rs. 1,56,775 in the year under report ; the net deficit amounted to Rs. 23,348 which is put down to 1,000 Khandis of teak withheld from sale in Kodibag Depôt. The decrease in expenditure (Rs. 3,12,454) occurred in all divisions and is accounted for by the emergency cut in the salaries of Government servants, less intensive departmental fellings than in the previous year, slack work by some contractors, and curtailment in expenses wherever possible. Fall in prices of labour also is said to have contributed to the decrease.

2. The number of forest offences was 2,718 as against 3,236 in 1931-32. Although there was a decrease of 518 in the total number of offences, small increases were recorded under some of the heads in the various divisions. It is satisfactory to observe that offences of unauthorised fellings in Belgaum decreased from 583 in 1931–32 to 346 during the year under report. The previous year's figures were swollen partly on account of the aftermath of Civil Disobedience movement. Out of 421 cases of forest fires only 5 were detected, and the offences in all these cases were compounded. The Commissioner fears that part of the decrease in offences is unreal as some of the offences actually committed may have remained undetected due to the recent depletion of staff in some areas necessitated by the financial stringency.

3. Grazing fees recovered during the year amounted to Rs. 86,215 as compared to Rs. 88,784 in the previous year. The fall of Rs. 2,569 is ascribed to the fact that last year's collections included recoveries of arrears; also it appears to be partly due to the smaller number of cattle admitted to grazing which was 4,00,534 as against 4,49,953 in 1931-32. Impoundings of cattle for unauthorised grazing numbered 11,097 as against 15,707 in the previous year. The decrease was shared by all divisions except Kanara E. D., the Dharwar-Bijapur division alone being responsible for a decrease of over 4,000. This may indicate that people have begun to realise their duty towards the protection of forests, and that the evil effects created by the Civil Disobedience movement on the minds of the law-abiding population have disappeared.

4. The revenue administration of the four Forest Mahals, viz. Dandeli, Kulgi, Virnoli and Kirwatti, continued to be satisfactory.

5. It is gratifying to find that the working of the Alnavar-Dandeli railway, which had caused a loss of Rs. 3,641 in 1931–32, showed a marked improvement with a net profit of Rs. 6,988. This was possible partly on account of the increase in the goods traffic and partly on account of the reduction in the maintenance charges on structural works.

6. The spirit generated by the Civil Disobedience movement was, in a small degree, felt in the Kanara E. D. in the form of forest offences. In Kanara S. D. attempts to intimidate buyers of timber were frustrated by the action of the Divisional Forest Officer who convened a conference of all contractors, at which the District Superintendent of Police was present and assured them of protection against possible mischief by Congress agitators. The contractors agreed to form a syndicate and take over the entire stock of *matti* wood in the Depôt. In the Belgaum Division 2 villagers of Pachapur were apprehended for unauthorised cutting of sandal-wood sapplings and jungle-wood trees, and their prosecution ended in conviction. One villager concerned in the affair is still at large.

7. The year was uneventful and the cordial relations between the Revenue Department and Forest Department were maintained.

Kolaba Division.—The total revenue from the working of the forests rose from Rs. 1,57,503 to Rs. 1,67,775, i.e. by Rs. 10,272, while the expenditure fell from Rs. 1,26,389 to Rs. 1,22,287 i.e. by Rs. 4,102, the net increase in revenue being Rs. 14,374. The increase in revenue is attributed to coupes fetching better prices and to the sale of a larger number of royalty trees. Observance of economy due to financial stringency and the 10 per cent. emergency cut on salaries throughout the year are responsible for the fall in expenditure.

The total number of forest offences during the year was 1,538 as against 1,611 in the previous year. The decrease occurred under all the heads except " other offences ". Violations of transit rules account for the increase of 31 under " other offences ". The fall in the number of offences is too small to justify any inference since so much depends on the vigilance and activity of the staff.

The number of cattle admitted to grazing was 77,204 as against 77,599 in the previous year.

The casuarina plantations at Akshi and Nagaon on the sea coast continued to suffer damage by erosion causing the uprooting of 188 trees and the washing away of an area measuring 10 acres 1 guntha. The Collector of Kolaba reiterates his last year's suggestions that means should be devised to check further damage to these plantations.

Cultivation of *nagli* and *wari* in areas under regeneration showed a further increase, being resorted to in 49 coupes as against 46 coupes in the previous year. The gradual extension shows that more people are taking advantage of this form of cultivation.

The appeal of Sardar Biwalkar against the decree of the Thana District Court in regard to certain forest areas was dismissed with costs by the High Court on 15th March 1933.

The Forest Advisory Committee of Kolaba held two meetings during the year but no subjects of importance were brought forward for discussion. The Collector of Kolaba repeats his suggestion of last year for a change in the composition of the Committee. The Commissioner sees no occasion to alter his opinion expressed last year.

The year was peaceful and the administration was satisfactory, the relations between the Revenue Department and the Forest Department being cordial throughout.

P. E. AITCHISON,
Chief Conservator of Forests,
Bombay Presidency.

Poona, 14th October 1933.

MO-III Bk E 55—10

Report.

Forest Department.

Administration — of, in Bombay Presidency, including Sind, for 1932–33.

GOVERNMENT OF BOMBAY.

REVENUE DEPARTMENT.

Resolution No. P. 57/1662.

Bombay Castle, 8th February 1934.

Letter from the Chief Conservator of Forests (Mr. P. E. Aitchison), No. 2/1548, dated the 14th October 1933—Submitting the Forest Administration Report of the Bombay Presidency, including Sind, for the year 1932–33.

RESOLUTION.—Ever since the year 1930–31 when the surplus on the working of the forests in this Presidency fell, at one jump, from 36·63 lakhs to 9·78 lakhs, the department has been steadily trying to recover lost ground. In 1931–32, the surplus was 16·07 lakhs while during the year under report it was 23·48 lakhs. One feature that contributed to this improvement was the almost total absence of the civil disobedience movement and its attendant boycott of the timber trade. But the timber market itself showed no more than a slight improvement. Having regard to all the circumstances Government consider that the financial results of the year's working are encouraging, but it will be probably some time before the prosperity of the years previous to 1930–31 will be reached and maintained.

The department, free from the strain of combating the civil disobedience movement, was able to concentrate on the work of conservancy. It is gratifying to observe that there was a fall in the number of recorded offences, particularly those relating to injury by fire. Government observe with pleasure that the harmony existing between the department and the villagers living in forest villages was maintained and that the latter turned out promptly to put out fires. The variations in the number of offences other than those of injury by fire are comparatively trivial and are due to no special reason.

The experimental work of the department during the year was satisfactory, though there was no notable advance in any particular direction. On the engineering side there was greater activity than during the previous year. The total expenditure on roads and bridges was Rs. 1,59,000 as against Rs. 1,34,000 in 1931–32 and on buildings Rs. 53,251 as against Rs. 29,000.

The value of major and minor produce removed by purchasers amounted to Rs. 26,67,000 and Rs. 9,26,000 as against Rs. 24,05,000 and Rs. 9,36,000, respectively, in 1931–32. Major and minor produce removed by concessionists and free grantees amounted in value to the large sum of

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Rs. 12,24,000. The number of cattle admitted to grazing was 23,50,000 of which 6,50,000 were allowed free, the corresponding numbers for the previous year being 23,27,000 and 6,09,000. The collection of grazing fees rose from Rs. 4,83,000 to Rs. 4,99,000.

The figures in the above paragraph give some idea of the part played by forests in the economic life of the agriculturists in this Presidency. It is clear that, on the one hand, the exploitation of forests as a commercial concern and, on the other, the maintenance of forest privileges, with as little irksomeness as possible to villagers, require a great deal of tact and sympathy. That, during the year under report, both objects were achieved with such conspicuous success is a tribute to the officers serving in the department.

By order of the Government of Bombay
(Transferred Departments),

T. E. STREATFIELD,
Under Secretary to Government.

To

The Commissioner in Sind,
The Commissioners of Divisions,
All Collectors, including the Deputy Commissioner, Upper Sind Frontier,
The Chief Conservator of Forests,
All Conservators of Forests,
The Senior Superintendent of Land Records, S. C.,
The Director of Agriculture,
The Director of Industries,
The Compiler, General Administration Report,
The Commissioner of Labour and Director of Information,
The Oriental Translator to Government,
The Accountant General,
The General Department,
The Finance Department,
The Public Works Department,
The Secretary to the High Commissioner for India, London (by letter).

BOMBAY : PRINTED AT THE GOVERNMENT CENTRAL PRESS.